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VERMONT.

AN HISTORICAL AND STATISTICAL STUDY OF THE PROGRESS OF THE STATE.

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Explanatory Note.

This paper, as originally planned, was intended to form part of an official document of the state of Vermont. With that purpose in view, Hon. W. P. Dillingham, United States Senator from Vermont, secured the consent of the Department of Commerce and Labor that the Census Bureau in that Department should prepare such tabulations as might prove to be necessary. Accordingly, the tabular studies were sketched out and forwarded to the Director of the Census, and the tables upon which this paper is based were then prepared in the Census Bureau under the supervision of Dr. Joseph A. Hill, Chief Statistician for Revision and Results.

After the paper had been completed, it proved impracticable to publish it as originally intended, and the American Statistical Association has been thus able to secure for publication in the Quarterly this historical and statistical study.

Mr. Rossiter's paper is presented in full in the following pages, but the detailed Census tables upon which the summary tables are based have been omitted because of their length. The studies of total population and of certain statistics of agriculture are based upon the returns of the 13th Census (1910). For age, nativity, and manufactures no returns of the 13th Census are yet available (March, 1911), hence the figures upon which the computations for age and nativity are based are those of 1900. There is good reason to believe, however, that the changes during the last decade are merely continuations of tendencies previously noted. The figures used for manufactures are derived from the latest available returns, the Industrial Census of 1905.

It should perhaps be added that the author's purpose in preparing this paper was to furnish to the people of Vermont an orderly and accurate statistical analysis of population conditions in the state. It was believed that such an analysis, if properly prepared, would prove of great value in the consideration of present day problems, and might lead to the practical application of statistical analysis to similar problems in other states.

Editor.

I. A State Unique in American History.

The early history of each of the older commonwealths which comprise the United States is principally a narrative of discovery, settlement and growth. The states included in this group did not differ materially in climate and physical characteristics. They were settled at about the same period and by the same race. Hence it is not surprising that in general their early history was largely a repetition of similar facts. The individuality, stirring achievement, and clash of races which mark the formative periods of states and even of provinces in Europe have, therefore, been lacking in the United States, and such differences as appear in the history of one member of the Federal Union as compared with that of another are for the most part the small variations of environment or of local detail in the sense that the life of one placid citizen differs from the lives of his neighbors.

While this agreeable but somewhat monotonous record of progress in general characterizes all the earlier states, one of this group encountered exceptional problems, and reached statehood only after a protected period of anxiety and trial. This exception to normal historical progress is Vermont, a state which in size, location, period of settlement, and the antecedents of pioneers might have been expected to offer the most uneventful of all local annals.

The North American Colonies of Great Britain wrote their most stirring history in contests with the mother country; Vermont, however, was never a separate British Colony. The period which tried men's souls in the New Hampshire Grants, as Vermont was then designated, was the half century of struggle to preserve the individual home from the cupidity of New Yorkers, and civic independence from the injustice of the Continental Congress.

The people of Vermont bore the brunt of many of the northern battles of the Revolution, both on land and water solely from principle and from a keen sense of kinship. These convictions they proved with Arnold on Lake Champlain, and at Bennington and Saratoga, yet the Green Mountain people had no personal quarrel with Great Britain. In fact,

much was to be gained by peace with the mother country, since the success of the British meant immunity from border warfare and the dignity of a separate colonial establishment. On the other hand, rebellion meant the exposure of the entire northern and western borders to the incursions of British and Indians, and this merely to aid the men of other colonies, who planned to divide among two states, at least, the area comprised in Vermont, which was still practically without a name.

Realization of the exceptional and extraordinary conditions which confronted the people of Vermont during the Revolutionary period, fully justifies the assertion that the patriotism, self-restraint, and sagacity which they exhibited have never been surpassed by the people of any other state in the Union.

The subsequent history of Vermont has been much affected by the events of the formative period. The traits and traditions of the fathers have endured. The people have continued sedate and self-controlled at home, and patriotic and sagacious in national councils. In consequence Vermont has exercised an influence in Congress much greater than might be expected from the size and population of the state.

So unique and inspiring has been the history of Vermont that no discussion of present day population or economic conditions within the state will be complete unless preceded by a summary of the manner in which the ancestors of the citizens of today won success by arms and council and diplomacy. The achievement of these early leaders cannot be too closely studied, not only as throwing much light upon the conditions and characteristics which prevail at the present time, but especially as a source of inspiration and encouragement in solving some of the problems which beset and tend to discourage some Vermont communities of today. Moreover, the other states of the Union have travelled so far from the conditions which prevailed in youth, that the early history of any one of them would have little direct bearing upon latter day problems. In Vermont the change has been less marked. Her hills still rear their lofty sides to the clouds, clad with green as when Ethan Allen threatened to retire to their solitudes with his fellow-citizens and wage war with the world in defense of Vermont's independence; the population

of the state continues comparatively small, and remains distinctly agricultural at a time when all America is city mad. The people are principally of the native stock; they dwell much as their fathers dwelt, not in large towns, but in small hamlets and upon mountain sides, in the narrow, irregular valleys, by the blue waters of lakes, or upon the banks of hurrying rivers.

To these men, many of whom live in the same houses which the men of '76 constructed, the achievements of the fathers may well prove a mighty inspiration toward the greater and finer Vermont of the future.

II. Summary of Early History.

In the year 1910, the trip from the Massachusetts coast to Brattleboro, Vermont, may be accomplished easily in a few hours. In the settlement of New England, the advance of population from the coast to Vermont required more than one hundred years. The colonization of Massachusetts began in 1620, but the first blockhouse in Vermont was not built until 1723.

The area which now comprises the state of Vermont was vaguely included in an early grant made by Charles the Second to the Duke of York, and this formed the basis of the subsequent aggressive claims of the colony and the state of New York. On the other hand, the colony of New Hampshire made claim to the same area upon the strength of a later grant which seemed to indicate that the western boundary of New Hampshire was a continuation of the boundary line between Massachusetts and New York. Prior to the middle of the eighteenth century, however, for all practical purposes, New Hampshire was bounded by the Connecticut river, and there seems to have been little disposition to colonize the area now included in Vermont. Lake Champlain was for more than a century the highway of sanguinary warfare between France and England and the savage allies of both nations. Principally, no doubt, because of its exposed situation, the mountain dotted area between the Connecticut and the lake remained an unbroken wilderness, although the adjacent portions of

New Hampshire, New York, and Massachusetts steadily increased in population.

In 1749, the shrewd and practical royal governor of New Hampshire, Benning Wentworth, perceiving an opportunity for personal profit, began the sale of townships under the authority of proprietorship by New Hampshire, based upon the grant by King George the Second in 1740. Governor Wentworth first chartered the town of Bennington in 1749. Within two years one hundred and eight grants had been made, extending to a line twenty miles east of the Hudson and northward to the eastern shore of Lake Champlain. The policy of Governor Wentworth, which had been fully communicated to Governor Clinton of New York, was vigorously opposed by that official, but the New Hampshire Governor exhibited greater energy and shrewdness than his New York colleague. In consequence, although in 1763 Governor Colden of New York claimed jurisdiction over the territory in which grants had been made, the authority of the New Hampshire executive continued paramount, doubtless due to the self-interest of the colonists, nearly all of whom had made their purchases of Governor Wentworth. The contests between the governors of the two colonies were sharpened by the fact that each grant of land resulted in a personal perquisite, since the governor reserved five hundred acres in each township for himself.

At this period (1764) appeal was taken to the crown and although the representations of the colony of New York were in some respects fraudulent, the decision of the British government in favor of the New York colony would have been accepted by New Hampshire and the entire controversy between the two colonies could have been adjusted amicably, had it not been for the unwise attempt of Governor Colden to make the decree retroactive. The population of the disputed territory now comprising Vermont, which by the date mentioned had acquired the colloquial name of New Hampshire Grants, amounted to several thousand inhabitants, all of whom had purchased their holdings in good faith and had labored for a considerable period in the development and improvement of their property. They were a strong,

rugged race, virile and independent, and were not to be dispossessed merely by a royal decree. The attempt, therefore, of the governor of New York to evict an entire colony was obviously doomed to failure although the colonial legislature, obediently following the behest of Governor Colden and his successors, continued to pass laws even so late as the revolutionary period, and to approve proclamations directed against the settlers in the Green Mountains. These, however, were never more than partially enforced. The people of Vermont, intent upon protecting their homes, early organized the famous band known as Green Mountain Boys, and the fame of this organization of vigilant farmers, spreading far and wide beyond the boundaries of the disputed territory, was doubtless one of the principal causes of successful resistance to New York.

It is not necessary for the purposes of this paper to trace the events, which followed in rapid succession, in the contest between the settlers on the one hand and the grasping officials of the colony of New York. It is important, however, to observe that the settlement of Vermont differed from that of other states in that it began by individual purchase of property, to which practically all the titles were defective and actually disputed by the authorities of a powerful colony. Moreover, the attempt to make innocent purchasers suffer because of this alleged defect, successfully opposed by the banding together of young communities with the common object of repelling authorities regarded as oppressors, resulted in unusual unity early in the career of the Commonwealth. There is no evidence that aid or counsel was secured from New Hampshire, nor does it appear that any appeal was taken to the authorities of that colony.

The contest between the settlers and the colony of New York was soon overshadowed by the gravity of the approaching struggle between all the colonies and the mother country, the first events of which occurred upon the borders of Vermont. Ticonderoga, with its great store of supplies, was taken by Ethan Allen and Arnold at the head of a band of hardy mountaineers and the battles upon the lake which followed, bravely contested by Arnold and his volunteers from Vermont,

New York, and Massachusetts, made it evident to the British nation that the revolt was assuming serious proportions. Thus far, and as the War of the Revolution opened, it will be observed that the New Hampshire Grants had no political status whatever. The area comprised under this term was not a British colony. New Hampshire nominally claimed jurisdiction and a similar claim was advanced by New York, but both had thus far been completely ineffective. Indeed, at the outset of the Revolution, the western part of the New Hampshire Grants were continuously involved in turmoil or incipient warfare resulting directly or indirectly from conflicting jurisdiction. On the 23rd of June, 1775, the Continental Congress, desiring the support of all sections of the revolted colonies, recommended to the governor of New York that they, consulting with General Schuyler, employ in the army to be raised for the defense of America, those persons designated as "Green Mountain Boys" under such officers as the said Green Mountain Boys should choose. With a copy of this resolution and a letter from John Hancock, as President of Congress, Ethan Allen and Seth Warner, the leaders of the turbulent mountaineers, upon whose heads a price had been set but a few years before, appeared before the New York convention on the fourth day of July. In the face of some opposition the convention promptly directed that an independent body of troops, not exceeding five hundred, and including officers, be forthwith raised, to be called the Green Mountain Boys, under their own officers. A regiment was at once raised in the Grants and Seth Warner was made the Commander.

It will be noted that the Continental Congress thus for the first time referred directly to the New Hampshire Grants,—doubtless because of the impressive achievement at Ticonderoga, but the dealings were through the state of New York. Thereafter, however, the contest which had been formerly conducted between the Grants and New York, became a three-cornered contest between the Grants, New York, and the Continental Congress.

During the succeeding season, the old French and British highway of conflict, Lake Champlain, became again the

center of warfare by the appearance of the Burgoyne expedition. In the final defeat and capture of that commander and his army, the patriotic inhabitants of the New Hampshire Grants bore a leading part. Bennington, in the state of Vermont, was made famous by a sanguinary battle that lowered the prestige of the British army, and the cannon which now stand before the state house at Montpelier bear witness to the patriotism and fighting qualities of the early citizens of the state. They were, however, conducting a contest under most unusual conditions. The men of the Grants were practically without a country, certainly without organized government. Vermont had no recognition and no representation in the Continental Congress, which was supposed to represent all the revolted colonists. In consequence, although citizens of the Green Mountains had freely shed their blood in the cause of liberty, no Vermont name appears upon the Declaration of Independence.

In 1776 the condition of the inhabitants of the Grants became so confused that they decided to form a government of their own. Having emphatically refused to submit to the jurisdiction of the royal government of New York, they were equally unwilling to compromise their rights by admitting the jurisdiction of the Continental State of New York which had succeeded the British Colony. The people of the Grants, indeed, awoke to the fact that they had thus far performed more than their share of warfare for the benefit of others who appeared only desirous to oppress them.

A petition was accordingly sent to Congress, stating that the inhabitants of the New Hampshire Grants, while ready to do all in their power for the common cause, were not willing to act under the jurisdiction of New York, lest it might be an acknowledgment of the claims of that state and prejudicial to their own rights and independence. Hence, while they were willing to perform military service, they declared that it must be as inhabitants of the Grants and not as citizens of New York.

No response was made by Congress to this memorial, due in all probability to the influence of New York in that body. In consequence, no satisfactory report could be made to the

convention of representatives of the towns which assembled to meet the delegate upon his return from Philadelphia. It was decided to form an association of the inhabitants in all the districts commonly known as the New Hampshire Grants. Although the warfare on Lake Champlain which followed, made it impossible to hold another convention until January, 1777, popular sentiment by that time had so ripened that it was resolved by the convention then held as follows:

"We will at all times hereafter consider ourselves a free and independent state, capable of regulating our internal affairs in all and every respect whatsoever, and, that the people on said Grants shall have the sole and exclusive and inherent right of governing and ruling themselves in such manner and form as in their own wisdom they shall think proper, not inconsistent or repugnant to any resolve of the honorable Continental Congress."

It was first decided to call the new state recommended by this resolution the state of New Connecticut, but this was changed in the succeeding June to Vermont, a name suggested by Dr. Thomas Young of Philadelphia, who proved to be a firm friend and defender of the rights of the Grants. This public spirited citizen indeed went so far as to address a letter to the inhabitants of the Grants, advising them of the general attitude of Congress and urging the adoption of such form of government as should appear to the representatives of the people to be most conducive to happiness and safety.

This letter caused infinite annoyance to the delegates in Congress from New York, who warmly attacked it. Subsequently the petition of Vermont to Congress was dismissed. The retention of Col. Warner as an officer in the Continental Service from the Grants was made the subject of an apology, and Dr. Young was censured.

The events in Philadelphia did not favorably impress the inhabitants of the Grants. They promptly accepted Dr. Young's advice and in July, 1777, at his suggestion, adopted a constitution modeled upon that of Pennsylvania. In this constitution, slavery was prohibited, Vermont thus being the first state to take formal action upon this subject.

Owing to the invasion of the northern country by General Burgoyne and the absorbing events of the two campaigns of '77 and '78 which followed, the population of the Grants was not only in a constant state of excitement and warfare, but also materially decreased. It was, therefore, not until the 12th of March, 1778, that a state government was fully organized. Thomas Chittenden, a native of Connecticut, was made the first governor of the state. Although a man of rather limited education, he possessed great strength of character and unusual sagacity. So wisely did this early father of Vermont administer his office that he was continued as governor both of the independent commonwealth and of the state, for a period of eighteen years.

In 1778, sixteen towns east of the Connecticut river applied for admission, desiring to withdraw from New Hampshire. It was unwisely decided by the first legislative assembly to admit these towns. No one appeared to reflect upon the fact that such action would irritate the state of New Hampshire, which hitherto had made no aggressive claims to jurisdiction, and that, in consequence, ill-feeling would be created on the east to complicate the hostilities of New York upon the west.

Dr. Samuel Williams, who narrates these events in his "Natural and Civil History of Vermont," written about 1793, makes this interesting comment: "These proceedings were founded upon principles which might introduce endless contentions and divisions among the United States and they justly proved greatly alarming to New Hampshire."* Dr. Williams could not know that this action of the sixteen towns, which was in reality the first secession movement, foreshadowed a weakness in the federal system which finally resulted in the civil war between the states.

All Continental troops had now been withdrawn from Vermont, and the young state was thus compelled not only to struggle for its own independence with its neighbors and supposed allies, but also to defend its extended northern and western borders. The contest with the state of New York over the question of governmental control had, indeed, become so acute that it was necessary for Allen to take the field with

*Sam'l Williams, History of Vermont, Walpole, N. H., 1794, p. 243.

a detachment of Green Mountain Boys to quell the increasing turbulence of New York sympathizers upon the southern borders. New York thereupon pressed upon Congress its claim to the entire grants, and New Hampshire, irritated by recent events, promptly entered a counter claim. Both of these states being fully represented in Congress, it seemed probable that that body would compromise this annoying and troublesome internal problem by dividing the Grants between the contending states. Fortunately, at this point, Massachusetts, possibly with the definite purpose of preserving the Grants (reasonable because of the great number of natives of Massachusetts among the settlers), complicated the question by setting up an aggressive claim to the southern portion of Vermont, founded on an ancient grant to the Plymouth Company.

It should be observed that from the beginning to the end of the controversy the Continental Congress completely ignored the wishes of the people of Vermont, and considered only the best means of temporizing and of placating the colonies which were contending over the acquisition or division of the defenceless little self-erected commonwealth.

It was decided to advise the three states to submit their claims to Congress for decision. Although Vermont, whose vital interests were at stake, was ignored in this resolution, her unacknowledged government was enjoined to make no more grants of unoccupied lands and to exercise no authority over those persons who did not yield allegiance. New Hampshire and New York promptly agreed to submit their claims to Congress, doubtless expecting partition, but Massachusetts failed to take any action, apparently again with design.

Claimed by three states, ignored by the Continental Congress, and open to attacks on the north and west from hostile British forces which were being massed upon the St. Lawrence, the condition of affairs in the young commonwealth became exceedingly grave. In the face, however, of these accumulating difficulties, the people grew bolder and more uncompromising. The legislature resolved to support the claim of the inhabitants, not only before Congress, but before the world, and to continue to make grants of unappropriated lands.

A series of pamphlets were prepared by the governor and council, aggressively setting forth the rights of Vermont, and Ira Allen, one of the foremost and ablest citizens of the state, was sent to the legislatures of New Jersey, Pennsylvania, Delaware, and Maryland, to interest them and to enlist their support. Although Congress made no disposition of the Grants problem and obviously intended to avoid early decision, it is probable that an understanding had been reached between New York and New Hampshire to divide the Grants between them.

In June, 1778, Congress passed a resolution emphatically rebuking the inhabitants of the Grants for their independent attitude and requiring them to cease the exercise of authority over persons who professed allegiance to other states. Vermont responded with aggressive resolutions, announcing herself as an independent state and denying the authority of Congress. It was further declared that as the commonwealth was refused admission to the sisterhood of states, she was at liberty to make terms, if she so desired, at any time with Great Britain. The leaders, however, continued very solicitous concerning the action of Congress. Colonel Allen, returning from Philadelphia, reported that an unpleasant impression had been created by the annexation of the sixteen New Hampshire towns, and that if this action were reconsidered, none of the members of Congress, except the delegates from New York, would oppose the independence of Vermont.

Accordingly, the convention which assembled at Windsor in October decided to refuse admission to the representative from the sixteen towns. February 12, 1779, the assembly of Vermont formally voted to dissolve the union between the Vermont and New Hampshire towns and communicated this resolve to the governor of New Hampshire.

In September, 1779, another effort was made in Congress to bring the controversy to a conclusion. New York and New Hampshire both asserted their rights to the disputed territory and claimed that Vermont had no right to independence but belonged to them. Agents of Vermont were present but were not treated with or recognized, and in the long discussion in Congress which followed, they were ignored to a degree which

led them to protest against the whole proceeding, and subsequently to withdraw. Congress, having heard the evidence on the part of New York and New Hampshire, again postponed consideration of the subject. There is little doubt but that a decision would have been reached at that time in favor of one or the other of the two contestants, were it not known by many members of Congress, that rather than submit to the authority of either New Hampshire or New York, the people of Vermont would make terms with the British government. It was clear, therefore, that final decision would prove especially dangerous by precipitating a crisis with the troublesome Vermonters.

Disappointed in her expectation of admission to the Union, and alarmed by the methods pursued by New Hampshire and New York, the leaders in Vermont addressed themselves to the improvement of internal affairs and determined upon a bold and independent policy. Most of the towns of the western part of New Hampshire were still desirous of being annexed. Accordingly, articles of union were promptly arranged. A petition was also received from inhabitants from adjacent parts of New York, praying that Vermont afford them protection against the enemy in Canada and receive them into the Union with her. These towns were promptly accepted in a cautious resolution, laying jurisdictional claim to all the lands north of the northern line of the state of Massachusetts and extending to the Hudson river and from thence to a north line extending to latitude forty-five degrees, jurisdiction not to be exercised for the time being. Thus, while New Hampshire and New York were laying claim before Congress to the whole territory of Vermont, that spirited young commonwealth adopted the same policy and extended her claim over a considerable portion of the territory of both her adversaries. This policy proved an impressive object lesson to Congress. In addition, it was now well understood that negotiations were being carried on by the leading men of Vermont with the British generals in Canada and New York. This fact drew to Vermont the adherence of those persons upon the southern border who espoused the cause of the

British government and the prestige of the young state and her population as well increased with great rapidity.

In March, 1780, there began in reality a series of negotiations, remarkable for the extraordinary diplomatic ability with which they were carried on by the uneducated farmers of Vermont. These patriotic and farsighted citizens did not in reality waver for a moment in their allegiance to their own kin and the interests of the other colonies, disregarding the injustice with which their state had been treated. They were, however, keenly alive to the fact that their little state had been abandoned by unfriendly sister commonwealths, and that it was wellnigh defenceless in case of attack upon the northern or western borders. Lake Champlain, indeed, long had been the principal highway in North America for the hostile expeditions of Great Britain and France and their savage allies. The British occupied Canada at this time with a numerous, well organized army which could have descended upon Vermont at short notice and destroyed most of the settlements west of the mountains. It was obvious, therefore, that the existence of the commonwealth practically depended upon negotiations which the leaders now cautiously instituted.

Colonel Ira Allen headed the commission which conferred with the British authorities in Canada. He displayed extraordinary diplomacy. Having reached a point where decision was in sight, he would raise new and unexpected difficulties requiring further consideration, thus prolonging the proceedings without discouraging the British officials.

The effect upon the Continental Congress of these negotiations became most pronounced when a dispatch from Lord George Germaine, minister of state for America, to Sir Henry Clinton at New York was intercepted, and published in the Pennsylvania *Packet*. This despatch was dated February 7, 1781, and referred to the probable return of the people of Vermont to their allegiance. Nothing could have been better suited to promote the real interests of the young state than the publication of this letter. It was now evident to Congress that the British agents in New York and Canada had been ordered to receive and support the people of Vermont. They perceived the effect

that this would have upon the war. It was evident, also, that nothing would prevent such a conclusion but the admission of Vermont to the Union. It was further evident that the leaders in the young state were men of great sagacity and firmness, who had acted with impressive ability. Congress immediately passed another resolution couched in different language from those which had preceded. It was officially transmitted to the legislature of Vermont and stated that Congress had heard the dispute which had been submitted to them, that the people who had claimed to exercise authority as a sovereign state had requested to be admitted into the Union, that a committee of five be appointed to confer with such person or persons as might be appointed by the people residing in the New Hampshire Grants or by their representative body, respecting their claims to an independent statehood and to report on what terms it might be proper to admit them into the federal union in case their independence should be recognized. It was further suggested that the committee from the New Hampshire Grants be sent at once to Philadelphia. Congress further announced, however, that it was an indispensable preliminary that the territory called Vermont should be reduced to its original dimensions and that those portions annexed from New York and New Hampshire should be returned.

General Washington, who thus far had watched the controversy with considerable anxiety, addressed a letter to Governor Chittenden, inquiring the real desire and views of the people of Vermont and asking if they would be satisfied with the independence proposed by Congress or whether they seriously contemplated joining the enemy. Governor Chittenden returned an unequivocal response, assuring General Washington that no people on the continent were more devoted to the cause of liberty than those of Vermont, but that it was a fact that they would oppose the government of New York by force of arms and would, if necessary to avoid annexation, join with the British in Canada.

The resolution of Congress was not regarded as being made entirely in good faith and the legislature answered somewhat guardedly. New York was greatly irritated at this develop-

ment and some turbulence occurred in the southern portions of the Grants. Meantime, the negotiations between Vermont and the British in Canada, which had resulted in preventing an attack during the campaign of 1781, when the British penetrated as far as Ticonderoga, but carefully avoided any incursions upon the shores of Vermont, were broken off temporarily by the surrender of Lord Cornwallis.

The assembly met in Bennington in February, 1782, and the response of General Washington to Governor Chittenden's letter, advising the people of Vermont to return to the old limits and thus to become a member of the Union, proved effective. The assembly resolved to accept the proposition of Congress. The lines of the state were accordingly redrawn and the resolution of the Continental Congress was complied with. Four agents and delegates were chosen to represent the state in Congress and the governor was authorized to negotiate the admission of Vermont.

At this point, the insincerity of the Continental Congress again became clearly evident, a result which was possibly due to the continuing intrigues of New York and New Hampshire.* It proved impossible to secure compliance with the resolution of Congress. Representatives of Vermont arrived in Philadelphia March 31st and a committee was appointed by Congress to confer with them. The committee reported on April 17th in favor of admission, but Congress refused to take any action. Perceiving that there was no possibility of success, the agents of the state addressed a letter to the president of Congress and departed. Dr. Williams remarks, concerning this event, which had occurred but a dozen years before the date at which he wrote:

"When every reasonable allowance is made, the conduct of Congress in this affair cannot be considered in any other than an unfavorable light. There could be no necessity of an evasive policy at a period when the public sentiment called for the decision of a question which had already occasioned so much trouble and danger. Their own faith and honor and what ought to have been infinitely dearer to them, the honor of their general, required the most unequivocal

*Charles R. Corning: Sketch of Samuel Livermore; pp. 18–25.

and punctual performance of what they had virtually engaged and led the people of Vermont to confide in."*

The officials and assembly of the young state properly regarded themselves as having been duped in order to bring the state into a weaker and more dangerous position than they had before occupied. It was accordingly decided that the state would endeavor to defend herself and would make no further solicitations of Congress to receive her into the Confederation, yet with much forbearance and persistence, it was decided that at each annual session, as a matter of form, she would appoint agents with powers and instructions to proceed to Philadelphia to negotiate the admission of Vermont into the Union. This action by the assembly was a remarkable manifestation of self-restraint and loyalty.

In 1782, Congress became more aggressive under the lead of New York and threatened the people of Vermont with invasion. Already profoundly irritated by these events, the governor returned a spirited reply, in which he obviously had the best of the argument. He intimated that Vermont had as much right to independence as the other colonies, and that her assembly possessed as much right to pass resolutions as did Congress, that the latter body was pursuing the same measures against the young state which Great Britain had used against all America, that it was no advantage to the confederation to pull down one arbitrary power in order to erect another; that the people of Vermont were in a position to frame their own laws and that they proposed to do so; that while they had no controversy with the United States, they were ready to vindicate their rights at any time against the usurpation of New York. In conclusion, Congress was told in plain and decisive language to keep hands off and to cease from meddling with the internal affairs of the independent Commonwealth of Vermont.

There now began a new phase of this interesting and historic controversy. January 21, 1783, peace was declared between Great Britain and the rebellious colonies. The termination of the war put an end to the embarrassment of Congress on the one hand and to all apprehensions of inva-

*Williams, History of Vermont, p. 287.

sion of Vermont on the other. Negotiations had been intermittently continued with the British authorities with sufficient earnestness and frequency to avoid any hostilities on the part of the British authorities in Canada, but with the declaration of peace these negotiations were no longer necessary. Moreover, union with the other colonies now became a matter of rather doubtful wisdom, since the influence of Congress began immediately to decline. Continental currency depreciated; revenues practically ceased; the armies of the confederation were unpaid. The debts of Congress were very heavy and there were no resources with which to meet them. The Continental Congress, indeed, harassed for money, possessed now but a shadow of authority, and the states which had participated in the rebellion were all heavily burdened with debt. In consequence, creditors of the Confederation were loud in complaint. Thus the affairs of the federation constantly became more deplorable, a condition which was increased by disorder, want of wisdom on the part of Congress, and lack of credit due to the absence of central authority.

On the other hand, by one of those sudden transitions, which sometimes occur in human affairs, from a position of danger and perplexity, the little state which had been buffeted and refused admission to the Union, found herself at once far more prosperous and tranquil than her neighbors. Vermont possessed no debt. Although the commonwealth had repeatedly placed her citizens under arms and in the field, practically no expense had been incurred by the assembly in so doing and the sale of public lands had created a considerable revenue. The state was not annoyed by the constant appeals of Congress to raise money, since it was not a part of the Union. Encouraged by the mildness of government, low taxation, the fertility and cheapness of lands, population had rapidly increased. There was nothing, indeed, in the affairs of the United States or in those of Vermont which could lead the inhabitants of that commonwealth any longer to wish for admission to the federal union. The people were law abiding, self-restrained, and prosperous. While education, other than the most rudimentary kind, was not general, the inhabitants were intelligent and far-sighted.

Their laws were adapted to the maintenance of peace and justice. The state was in fact henceforth, until her admission to the Union, what the legend on her copper coins declared her to be, "The Republic of the Green Mountains," independent of every other government. A standard of weights and measures was prescribed, the value of coins regulated, and a postal service established.* The bills of credit issued by the state suffered no depreciation and were faithfully redeemed. It was now the general inclination and desire not to be connected with the union of discordant and seemingly bankrupt states, if it could be decently avoided.

The events which followed in the confederation led to the Constitutional Convention and to the speedy formation of a comparatively strong central government. This procedure was watched with deep interest by the people of Vermont. When they at length perceived in the course of one or two sessions of the new Congress of the United States that the federal government was laboring to restore public credit and to establish a strong government and that the sessions of Congress were marked by wisdom and justice, a sentiment slowly arose favorable to union with the federal system.

By another curious change in political alignment, the attitude of New York was completely reversed. Many matters of federal policy developed which made it advisable for the larger colony to have the assistance of two senators allied by a similarity of interests which must prevail between New York and the little commonwealth across the lake. Accordingly, with all parties at length favorably minded, it became a simple matter to adjust the half century old differences between New York and Vermont which time had now rendered unimportant. The sturdy little republic was thus the first state, after the original thirteen, to be admitted to the federal union.

No one can read attentively the early history of Vermont, the struggles of the settlers, on the one hand, to preserve their homes against the charge of defective titles, and, on the other, their independence, now fighting or negotiating with the British, and now contending with those who should have

*R. E. Robinson, American Commonwealths-Vermont, p. 248.

been their closest allies, without profound respect for the genius and forbearance of the leaders of this small and primitive state. The direct effect upon the people of Vermont of the anxiety and peril existing for over a quarter of a century was to bind them together with unusual unity and to create a habit of mind leading to the deliberate, cautious, and sagacious consideration of every important topic in public and private life.

III. Elements of the Early Population.

Although the governor of New Hampshire was active in promoting the settlement of the Grants, that colony appears not to have furnished a generous proportion of the settlers. The greater part of the pioneers who subdued the Vermont wilderness were drawn from Connecticut and Massachusetts.

During the French and Indian wars, which occurred at frequent intervals about the middle of the 18th century, the older New England colonies contributed liberally to the British forces; and the militia from Massachusetts, Rhode Island, and Connecticut reached the theatre of warfare upon Lake Champlain by a military highway, known as the Crown Point Road, extending from the Connecticut River diagonally across the lower half of Vermont to the Lake. It is probable that many of the colonists who survived these campaigns carried back with them to their homes agreeable recollections of the hills and secluded valleys of the wilderness through which they had passed. That was a period of large families, and as agriculture was practically the only means of support, land for sons growing to maturity upon Connecticut and Massachusetts farms could not be provided by subdivision, nor by the purchase at low cost of new farms in the older and well settled localities. It was necessary therefore, to seek new homes. Doubtless the agreeable memories of the wilderness to the northward led many of the hardy sons of Massachusetts and Connecticut to turn toward Vermont. Similarly no doubt, natives of New York, who had traversed the southern end of Lake Champlain and had thus become more or less familiar with the Vermont shores and the distant, verdure clad mountains, were attracted to the same region.

It must be remembered that between 1740 and 1770 distance was an insuperable obstacle to emigration. Not only was travel through the wilderness with household goods practically impossible, but the danger of hostile Indians, ever present at this period, made it necessary to remain comparatively near to civilization as it was then understood. Vermont was an unsettled area close at hand, fertile, convenient, and agreeable. It offered attractive possibilities, therefore, to the pioneer and, as soon as the long continued differences between France and Great Britain were amicably adjusted, natives of Massachusetts eager for larger opportunity began the purchase of township rights of Governor Wentworth and settlements sprang up. At the same time, citizens of Connecticut, in even larger numbers, following the course of the Connecticut river, moved by slow stages into the wilderness. The great New England river was, indeed, an important factor in connection with the character and extent of the early settlements of Vermont. These began near its banks and slowly extended westward, but for a time the disputes which arose between New Hampshire and New York checked settlement in this area, although stimulating it further north along Lake Champlain.*

The immigration from Massachusetts appears to have been drawn from various parts of the colony. Not a few settlers of Vermont came from the coast towns but the greater number were drawn from the Connecticut valley and Berkshire. As the latter county, however, had been settled principally by natives of Connecticut, immigration from that region was in reality another but less direct contribution by Connecticut. So large indeed was the proportion of settlers drawn from that colony, that it may be justly said that the original inhabitants of Vermont, those who bore the brunt of the most trying period in the history of the little commonwealth, and their children, were distinctly Connecticut stock. Governor Chittenden was a native of Connecticut. The Allens, Ethan and Ira, were also natives of Connecticut, and many of the early senators and representatives and leading citizens of the state of Vermont after admission to the federal union were either

*R. S. Taft, Ver. Hist. Gazette, Vol. I., p. 492.

born in Connecticut or sons of natives of that state. It will be remembered, also, that the first name adopted, to give individuality to the so-called New Hampshire Grants, was "New Connecticut," which no doubt reflected the nativity of the majority of the settlers.

While no useful purpose will be served by tracing here in detail the origin of the early population of Vermont, it will be of interest to observe briefly sources of immigration as suggested by the origin of names of towns. Of the 211 Vermont towns already settled or set off at the date of the first census of the United States (1790) 76 were obviously named after older towns bearing the same name in other states. New Hampshire, Massachusetts, Rhode Island, Connecticut, and New York were the principal contributors,* but the same name frequently occurred in two or more of the states mentioned. Names drawn from older states may be thus summarized:

State.	Vermont Names Occurring in Older States.	Vermont Names Occurring in only One Older State.
Massachusetts	45	28
Connecticut	25	16
New Hampshire	19	6
Rhode Island	4	2
New York	9	1
New Jersey	1	1

Although the colony of New York undoubtedly contributed a considerable portion of the early settlers, they perpetuated few New York names, suggesting that New York immigration was limited or that it was drawn from few localities. Moreover, "Yorkers" and their descendants apparently were not numerous among those who achieved prominence. These facts suggest that the communities which struggled so bravely to maintain independence and manifested such persistent antipathy to New York, were of distinctly New England origin, and thus belonged properly to the New England group of states.

It is probable that no state in the Union was settled by choicer immigration than that which passed up the Connecticut river to the Green Mountains. Early immigration to

*Mathews, The Expansion of New England, p. 144.

the colonies from England brought many persons who, although of excellent British stock, had passed through a long period of privation, anxiety or bereavement. In a large proportion of cases, their presence in the new world was due to political or religious persecution. In some respects such colonists could not be regarded as ideal pioneers. A large proportion, indeed, were unaccustomed to manual labor. The settlers of Vermont, on the contrary, were all acclimated, hardy, accustomed from childhood to the use of axe and gun, eager, and full of ambitious purpose to found homes and communities of their own. They were all of the same stock; they possessed the same ideals; they were animated by the same purpose. Of 85,072 population reported at the Census of 1790, approximately 81,200 were of English origin and 2,600 Scotch. These two elements thus comprised more than 98 per cent. of the total population of the state at that period.

It is not remarkable, therefore, that Vermont has contributed an extraordinary proportion of the distinguished men of the United States, and to the upbuilding and prosperity of innumerable communities throughout the country. To the unusual quality of the original settlers and their early trials and high ideals is in large measure due the influence exerted by the state in national councils disproportionate to her own moderate interests in the national welfare. Moreover, the rare quality of the settlers has proved to the later generation an inheritance as valuable as a strong constitution to the individual: after half a century of population drain, there remains surprising virility.

IV. Population Change in Vermont Counties and Towns.

It is advisable in the discussion of population change to have clearly in mind the record which Vermont has made in number of inhabitants from the first Census to the thirteenth:

TABLE I.

POPULATION OF VERMONT AND PER CENT. OF INCREASE AT EACH CENSUS, 1790–1910.

Census Year.	Total Population.	
	Number.	Per Cent. Increase.
1790	85,425	....
1800	154,465	80.8
1810	217,895	41.1
1820	235,981	8.3
1830	280,652	18.9
1840	291,948	4.0
1850	314,120	7.6
1860	315,098	0.3
1870	330,551	4.9
1880	332,286	0.5
1890	332,422	*
1900	343,641	3.4
1910	355,956	3.6

* Less than 1-10 of 1 per cent.

From 1790 to 1910, the population of the United States increased twenty-two fold,—that of Vermont four-fold. If the population of the United States had increased at the Vermont rate, it would have been three millions greater in 1810 than it actually was, but in 1910 the Federal Census would have counted only 16,500,000 inhabitants, or slightly less than the population the United States actually reported in 1840. It is clear that the principal part of the increase which has occurred in the population of Vermont since the First Census took place during the 40 years which elapsed from 1790 to 1830. From that date to 1910, a period of 70 years, the population has shown an increase of but seventy-five thousand.

COUNTIES.

It has already been pointed out that the early settlements of Vermont began along the waterways which bound the state. The returns of the first Census reflect this fact in rather striking fashion. Windham and Windsor counties, which lie along the Connecticut River, and which comprised most of the earliest settlements, together contributed in 1790 more than one third of the total population. In 1910 they contributed about one sixth. In 1790, the lower half of the state, comprising the counties of Rutland, Bennington, Windham, and Windsor, included more than three quarters

of the total population of the state, but in 1900 these counties contributed but little more than one third. Hence, in general, population entered Vermont at the southern end of the state and followed the waterways on the eastern and western boundaries, but in 1790, after forty years of settlement, most of the inhabitants were still located in the southern portion of the state. In this area was found much excellent farming land; here also was readier access and slightly milder climate. Later the forests, water power, and mineral resources of the northern area attracted and supported a larger population. In consequence, the number of inhabitants in the lower counties a little more than doubled from 1790 to 1900, but that of the upper counties increased nearly ten-fold.

While the population of Vermont by groups of counties need not be considered in detail, it is interesting to observe in passing that the river counties, Windham, Windsor, Orange, Caledonia, and Essex have recorded an almost continuous decrease for half a century or more, having 112,731 inhabitants in 1910 as compared with 122,798 in 1850. On the other hand, the western, or lake counties, Bennington, Rutland, Addison, Chittenden, Franklin, and Grand Isle, have shown a moderate but nearly continuous increase during the period specified, rising from 139,964 in 1850 to 165,601 in 1910. The third group, or midland counties, as they may be called, Washington, Lamoille, and Orleans, have increased from 51,233 to 77,624 during the same period.

The eastern, or river counties, are principally agricultural, and reflect a decline in certain branches of industry which in general has been in progress, and especially reflect the influence of emigration to the western states. In the western counties, the manufacturing, the lumbering, and the quarrying interests clustering about Burlington and Rutland are responsible for substantially all the increase, while in the three midland counties the generous increase shown is contributed principally by the extensive quarrying interests which have come into existence during the last half-century.

TOWNS.

Number of towns decreasing in population from Census to Census: Here and there throughout Vermont, scattered towns

showed decrease in number of inhabitants at the Second and Third Censuses,—1800 and 1810. The Fourth Census did not report the population by towns, but at the Fifth Census (1830) nearly one sixth of all towns reported decreases. Much of this early decline, however, resulted from the movement of large numbers of persons from older communities in the lower part of the state to newer ones in Orleans and other northern counties. It must be remembered also, that during the early decades especially, some changes in town boundaries occurred, making accurate comparison of all towns for the whole period impossible. In 1790 there were 211 towns in Vermont; in 1910 this number (including cities) had increased to 254, but most of the towns added during the century were erected in territory unsettled in 1790. Therefore it is probable that changes resulting from partition and readjustment were not sufficiently numerous or important to seriously affect the following tables.

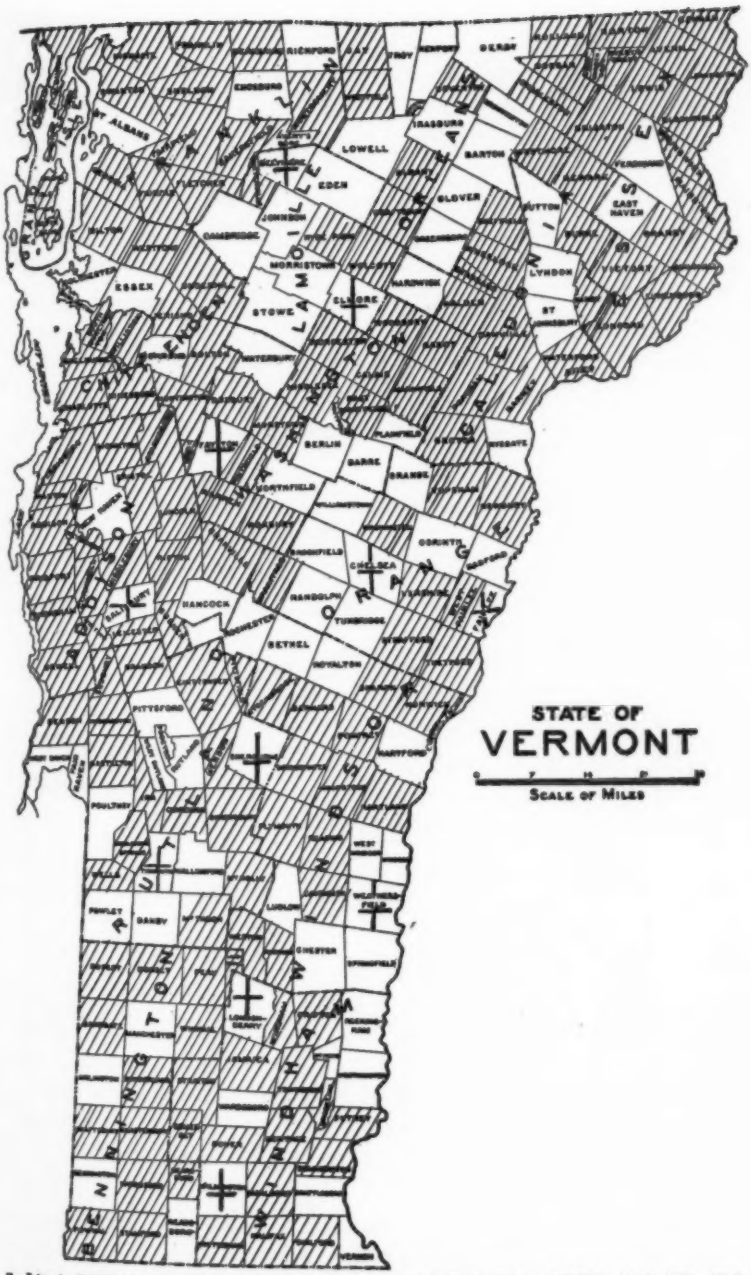
TABLE II.

TOTAL CITIES AND TOWNS IN EACH COUNTY IN 1910, AND NUMBER OF TOWNS SHOWING DECREASE IN POPULATION AT EACH CENSUS, 1850–1910.

County.	Total Number of Towns in 1910.*	Number of Towns Showing Decrease.										
		1910	1900	1890	1880	1870	1860	1850	1840	1830	1810	1800
Total.....	254	166	167	190	142	149	139	106	98	36	8	7
Addison.....	23	20	16	20	10	15	16	11	15	2	1	..
Bennington.....	17	13	9	15	9	10	9	4	9	5	4	3
Caledonia.....	17	12	13	13	8	12	11	10	2	1	..	..
Chittenden.....	17	11	8	12	15	6	11	2	6	..	..	..
Essex.....	19	16	14	6	3	6	4	6	4	2	..	..
Franklin.....	15	12	9	9	8	7	10	1	..	..	..	..
Grand Isle.....	5	4	1	3	1	4	2	1	..	..	..	..
Lamoille.....	10	3	8	7	4	3	3	5	2	1	..	..
Orange.....	17	9	10	16	10	14	16	15	9	2	..	..
Orleans.....	18	9	14	14	9	5	..	..	..	1	..	..
Rutland.....	28	15	21	20	14	13	17	10	15	7	..	1
Washington.....	20	12	11	13	14	16	8	12	4	1	..	..
Windham.....	23	16	16	20	17	20	16	11	18	10	3	3
Windsor.....	24	14	17	22	20	18	16	18	13	3	..	..

* Includes three towns and gores from which no population was returned in 1910.

By 1850 decrease of population in more than 100 towns appeared, doubtless due to a migration movement which now began to extend beyond the boundaries of the state. At the Census of 1860, for the first time, more than half of all



7. *Lined:* TOWNS WHICH DECREASED IN POPULATION FROM 1900 TO 1910
Crossed: TOWNS IN WHICH POPULATION WAS STATIONARY, 1900 TO 1910, OR INCREASED LESS THAN ONE PERSON PER ANNUM.

8. TOWNS WHICH REPORTED DECREASE OF POPULATION IN 1910, AS COMPARED WITH THAT OF 1850.

the towns in Vermont reported decrease in population. At each enumeration since 1860, the number of towns showing decrease as compared with the preceding census has not been less than three fifths; in 1890 three quarters reported decline, and in 1900 and also in 1910, approximately two thirds. Many more towns show decrease in population in 1910 as compared with the return for 1850, than show increase during that period (174 decrease, 80 increase). The accompanying maps indicate the towns which decreased in population from 1890 to 1900, and 1900 to 1910; those which showed a decrease in 1910 as compared with 1850, and those which decreased (or did not increase) at any census from 1850 to 1910.

Census year in which towns reached maximum population:—Approaching the analysis of population by towns from another standpoint, it proves of interest to observe the census year in which Vermont towns reached maximum population, from the First to the Thirteenth Census, inclusive.*

TABLE III.

NUMBER OF TOWNS AT EACH CENSUS ATTAINING MAXIMUM POPULATION, BY COUNTIES, 1790–1910.

County.	1910	1900	1890	1880	1870	1860	1850	1840	1830	1810	1800	1790
Total	32	10	13	26	16	24	36	27	40	21	3	1
Addison	..	1	..	4	..	2	3	2	9	2	..	..
Bennington	3	..	..	3	3	1	1	2	2	1	1	..
Caledonia	3	1	..	4	..	1	3	4	..	1	..	..
Chittenden	3	1	1	..	2	1	6	..	3	..	..	..
Essex	1	3	6	4	1	..	..	2	..	..	..	..
Franklin	2	2	1	..	..	1	8	..	..	..	..	..
Grand Isle	..	2	..	..	..	2	1	..	..	..	..	..
Lamoille	1	..	1	3	3	..	2	..	..	..	..	..
Orange	1	..	1	1	..	..	2	5	7	..	..	..
Orleans	4	..	2	4	2	6	.	..	..	..	..	..
Rutland	5	..	1	2	4	1	1	2	4	7	..	..
Washington	3	..	..	1	..	6	3	4	2	..	..	..
Windham	2	..	..	..	..	2	3	1	6	7	1	1
Windsor	4	..	..	..	1	1	2	5	7	3	1	..

The Census of 1830 shows the largest number of towns reaching maximum population as compared with the number reported at any of the other twelve enumerations; but in 1850 the number was almost as large. The maximum population reported up to date (1910) was reached by 129 towns prior to and including 1850, and by 121 since 1850.

*Towns which reached maximum population at Censuses prior to 1910 are shown graphically on pages 450–454.

6. CITIES AND TOWNS WHICH REPORTED MAXIMUM POPULATION IN 1910.

Addison County reports nine towns which reached their maximum population in 1830; in Caledonia the number of towns reaching a maximum was largest in 1840 and 1880, in Chittenden in 1850, Orange in 1830, Rutland in 1810 and 1910, Windham in 1810 and 1830, Washington in 1860, Windsor in 1830 and 1840, and Essex in 1890.

Towns which show continued increase in population comprise the alive or growing towns of the state, since communities in that class obviously are the largest at the most recent enumeration. For example, while the Twelfth Census was still the latest count, 36 cities and towns showed maximum population in that year. Upon the announcement of the Thirteenth Census, 32 cities and towns showed maximum population in 1910. Of this number, 26 were drawn from the total of 36 towns reporting maximum population in 1900, three from those previously reaching the highest figure in 1890, two from the 1870 group, and one from 1840.

To reflect decided improvement in population conditions in the state, the number of towns showing maximum population at the latest Census should increase materially. As a matter of fact, it proved in 1910 to be slightly lower than after the Census of 1900.

It is clear from the foregoing table that the smaller communities of Vermont for the most part attained their maximum population (thus far), during the first half of the last century, and the number of towns which now show maximum population at each succeeding Census, form but about one eighth of all towns in the state; these comprise, with a few exceptions, the cities, large towns, and industrial centers.

It is important in considering this phase of Vermont population statistics, to keep in mind the evident fact that a stationary aggregate population quickly shows the effect of such migration as occurs within the state. For example, the entire population of Vermont might concentrate in Burlington or Rutland, and while the Census would report Vermont as showing unchanged population, all the towns and cities but one would be wiped out. Transfers of population have occurred and are constantly occurring from small towns to larger ones and thence to the cities, and undoubtedly they affect the foregoing computations. This fact, however, does not decrease the sig-

9. TOWNS WHICH DECREASED IN POPULATION AT EVERY CENSUS FROM 1850 TO 1910.

nificance of the general shrinkage of population in the small towns. This shrinkage, moreover, is due much more to removal beyond the boundaries of Vermont than to movement from town to town within the state.

Comparison of the aggregate maximum population of Vermont Towns, with actual total population, 1910:—The steady decrease of inhabitants sustained by so many Vermont towns, and the fact that seven eighths of all attained their maximum population at some Census prior to that of 1910, scattered over a century of Census taking, create interest in the extent of the aggregate loss of inhabitants sustained by the state. It is clear that if all Vermont towns had grown in population during the 120 years of statehood, then the total number would have appeared under each succeeding Census as reporting maximum population up to that date Hence the difference between the population of the state in 1910, and the aggregate maximum population of each town at any Census, to some degree measures Vermont's population loss.

TABLE IV.

MAXIMUM POPULATION OF VERMONT, BY COUNTIES, RESULTING FROM USE OF LARGEST POPULATION SHOWN AT ANY CENSUS FOR EACH CITY AND TOWN.

Counties.	Maximum Popula- Shown at Any Census.	Per Cent. Greater than Actual Popula- tion in 1910.
The State	457,866	28.6
Addison	30,388	51.9
Bennington	27,104	26.8
Caledonia	31,895	22.5
Chittenden	47,802	12.6
Essex	10,286	39.3
Franklin	37,023	24.0
Grand Isle	4,855	29.1
Lamoille	13,953	10.9
Orange	30,614	63.7
Orleans	26,266	12.6
Rutland	59,334	23.3
Washington	48,393	16.0
Windham	40,689	51.1
Windsor	49,264	46.3

In 1910 the cities and towns of Vermont are 101,910 below their aggregate population highwater mark, a shrinkage contributed to by 218 towns out of 254 cities and towns. Mere retention in 1910, therefore, of the maximum population reached by the 218 towns at some earlier Census would have

meant a population at the Thirteenth Census 28.6 per cent. in excess of that actually reported.

Analysis of cities and towns showing increase in population:—What are the localities which have proved exceptions to population decline and recorded increases? It appears upon analysis that the ten largest towns in Vermont—those having a population in excess of 5,000 in 1910—are not only responsible, by their generous growth, for the entire increase in the state which has occurred during the last seventy years, but have actually overcome a decided loss of population in the remainder of the state. These towns are Burlington, Rutland, Barre, Montpelier, St. Albans, St. Johnsbury, Bennington, Brattleboro, Bellows Falls, and Colchester.

In securing the growth thus recorded, these cities and towns (as pointed out in a preceding page) have doubtless robbed the smaller towns of the state of their population to some extent. Increase can be secured only from reproduction and immigration. From both sources increase in Vermont is very slow. While, therefore, it is probable that the growing cities and towns increase at the expense of small towns, it must not be overlooked that they undoubtedly afford a satisfactory place of residence for some natives of the state who otherwise would have emigrated beyond its borders.

TABLE V.

INCREASE IN THE AGGREGATE POPULATION OF THE 10 LARGEST TOWNS IN VERMONT, COMPARED WITH REMAINDER OF STATE, 1790–1910.

Census Year.	Ten Towns.		Remainder of State.	
	Population	Increase Per Cent.	Population.	Increase Per Cent.
1790	7,594*	....	77,831	....
1800	12,453	64.0	142,012	82.5
1810	17,580	41.2	200,315	41.1
1820	†	†	†	†
1830	24,584	39.8‡	256,068	27.8‡
1840	27,541	12.0	264,407	3.3
1850	34,931	26.8	279,189	5.6
1860	40,835	16.9	274,263	—1.8
1870	59,054	44.6	271,497	—1.0
1880	62,881	6.5	269,405	—0.8
1890	75,480	20.0	256,942	—4.6
1900	91,077	20.7	252,564	—1.7
1910	104,028	14.2	251,928	—0.3

* Town of Barre not given in 1790.
† Population returned by counties only in 1820.
‡ Per cent. of increase as compared with 1810.

In 1800, when there were substantially no large towns worthy of the name in Vermont, the percentage of increase of population in the state, exclusive of the ten towns which subsequently become the most populous, was decidedly greater than the increase which occurred in the latter class. Ten years later, in 1810, the percentage of increase in both classes was substantially the same, and thereafter the increase of the aggregate population of the ten towns continued generous, except during one decade, and even approximated, indeed, to the increase shown by the entire United States. The percentage of increase from 1900 to 1910, however, is the smallest, with two exceptions, since 1800.

The remainder of Vermont, comprising distinctly rural communities and small towns and villages, reported a steadily diminishing increase, which in 1860 was transformed into a decrease, and has so continued, although at a nearly negligible rate, ever since. This decrease, however, has resulted in 27,261 inhabitants less in 1910 than resided in the state in 1850 outside of the ten cities and towns. The latter group increased 69,097 during the sixty-year period. Hence this small number of communities not only made good the loss which has been occurring elsewhere in the state for more than half a century, but also contributed the increase of 41,836 recorded by the entire state. Six of the cities and towns above specified (in general the larger ones) are located in the upper half of the state and four in the lower half according to the geographical division previously specified.

It will be observed that the maximum of what may be termed rural population was reached in 1850. This fact undoubtedly reflects the great change which came over the farming interests in the eastern states about the middle of the last century, resulting from the immense movement of population into the vast territory lying west of the Allegheny Mountains. This movement was quickened by the discovery of gold in California and the realization which it brought home to the people of the older communities in the east that unbounded opportunities existed in the half-discovered west, not only in connection with agriculture but with other forms of human activity.

Cities and towns classified by size:—Analysis of population change by compiling the aggregate number of inhabitants residing in towns of specified size, is of considerable value in reflecting the tendency of population to increase or decrease within the established group limits, but in many instances it proves of doubtful value because, by following a necessarily arbitrary classification, changes from census to census throw cities or towns previously included in one group, barely over the line into another. This process becomes somewhat misleading when groups of large cities are classified in the more populous states, but it does not prove so serious in the case of Vermont.

TABLE VI.

PROPORTION OF THE TOTAL POPULATION OF VERMONT RESIDING IN COMMUNITIES OF SPECIFIED POPULATION, 1850, 1900, AND 1910.

Towns of Specified Population.	1910.		1900.		1850.	
	Population.	Per Cent. of total.	Population.	Per Cent. of Total.	Population.	Per Cent. of Total.
Total.....	355,956	100.0	343,641	100.0	314,120	100.0
Under 500.....	19,100	5.4	13,940	4.1	10,020	3.2
500 and under 1,000....	60,247	16.9	69,820	20.3	42,422	13.5
1,000 and under 2,000..	90,256	25.4	96,962	28.2	164,828	52.5
2,000 and under 4,000..	77,217	21.7	78,983	23.0	90,740	28.9
4,000 and under 7,500..	32,195	9.0	37,316	10.9	6,110	1.9
Over 7,500.....	76,941	21.6	46,620	13.6	.....	.....

TABLE VII.

PROPORTION OF THE TOTAL POPULATION OF VERMONT RESIDING IN COMMUNITIES OF SPECIFIED POPULATION, 1850, 1900, AND 1910.

Towns of Specified Population.	1910.		1900.		1850.	
	Number.*	Per Cent. of Total.	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.
Total.....	250	100.0	252	100.0	248	100.0
Under 500.....	63	25.2	50	19.8	40	16.1
500 and under 1,000....	80	32.0	92	36.5	58	23.4
1,000 and under 2,000..	67	26.8	71	28.2	115	46.4
2,000 and under 4,000..	27	10.8	29	11.5	34	13.7
4,000 and under 7,500..	6	2.4	6	2.4	1	0.4
Over 7,500.....	7	2.8	4	1.6	....	....

The group of cities and towns exceeding 7,500 population was not represented in 1850, but it is significant that such communities contributed one fifth of the total population of the state in 1910. Sixty years ago, more than half the population of Vermont resided in the 115 towns which reported between 1,000 and 2,000 inhabitants, while 98 smaller towns contributed less than 17 per cent. of all. In 1910, however, but one quarter of the population resided in the former class and were comprised in but 67 towns. On the other hand, in 1910 the number of towns having less than 1,000 inhabitants had increased to 143 and these towns contained over 22 per cent. of the state's population.

The apparent advance of the smaller towns in reality is principally the result of shrinkage from the higher class. It reflects in most instances, the falling away in 1910, of population, which occurred during the passage of half a century, in certain towns having over 1,000 population in 1850. Thus the higher class showed 47 less towns, and the lower class an increase of 45. In 1850 a little more than one third of all the towns reported population under 1,000. In 1910 considerably more than half were comprised in this class. Such changes as occurred in 1910 as compared with those shown in 1900, appear to have been principally a forward movement of tendencies already manifested at the earlier Census.

The only group which maintained proportions in 1910 similar to those which existed in 1850, was that comprising towns having 2,000 to 4,000 population. It is clear that the towns which thrive are the more populous ones. Moreover, these communities prosper partly at the expense of the smaller ones, and partly by suffering less from departures, rather than by attracting population from outside the state.

By pursuing a slightly different method of analysis, to eliminate as far as possible the defect of arbitrary classification, it appears that the towns above 2,000 population in 1850 are the only groups which have increased in number of inhabitants. Thus, from whatever standpoint the subject of town population in Vermont is approached, it is clear that for more than half a century the small towns in most instances, have been growing steadily smaller in population, and the large towns

have been growing larger, with an aggregate increase a little more than sufficient to counterbalance the loss.

TABLE VIII.

POPULATION OF VERMONT AT GIVEN CENSUSES, CLASSIFIED BY TOWNS HAVING SPECIFIED POPULATION IN 1850; ALSO PERCENTAGE DISTRIBUTION OF TOTAL POPULATION AT EACH CENSUS, AS THUS CLASSIFIED AND PERCENTAGE OF INCREASE FOR PERIODS GIVEN.

Towns of Specified Population in 1850.	Population.			
	1850.	1880.	1900.	1910.
Total	314,120	332,286	343,641	355,956
Under 500	10,020	13,919	12,324	10,764
500 and under 1,000	42,422	46,606	42,365	40,940
1,000 and under 2,000	163,353	150,483	145,407	146,921
2,000 and under 4,000	90,740	109,249	123,934	135,936
Over 4,000	7,585	12,029	19,611	21,395
	Per Cent. Distribution.			
Total	100.0	100.0	100.0	100.0
Under 500	3.2	4.2	3.6	3.0
500 and under 1,000	13.5	14.0	12.3	11.5
1,000 and under 2,000	52.0	45.3	42.3	41.3
2,000 and under 4,000	28.9	32.9	36.1	38.2
Over 4,000	2.4	3.6	5.7	6.0
	Per Cent. of Increase.			
	1850 to 1880.	1880 to 1900.	1900 to 1910.	1850 to 1900.	1850 to 1910.
Total	5.8	3.4	3.6	9.4	13.3
Under 500	38.9	11.5*	12.7*	23.0	7.4
500 and under 1,000	9.9	9.1*	3.4*	0.1*	3.5*
1,000 and under 2,000	7.9*	3.4*	1.0	11.0*	10.1*
2,000 and under 4,000	20.4	13.4	9.7	36.5	49.8
Over 4,000	58.6	63.0	9.1	158.5	182.1

* Decrease.

V. Age and Nativity.

Thus far, the population of Vermont has been considered merely by the increase and decrease which occurred from decade to decade, and by geographical areas. It remains to sketch briefly the conditions which exist with respect to age and nativity, since both of these classifications are likely to throw some light upon the causes of the decline of population pointed out in the preceding chapter.

AGE.

Upon separating the entire population of the state of Vermont, as shown at the Census of 1850 and at that of 1900, into four age groups, the percentage which the number of persons in each group formed of the total was as follows:

TABLE IX.

PROPORTION OF THE TOTAL POPULATION OF VERMONT FORMED BY PERSONS IN EACH OF FOUR AGE GROUPS, 1850 AND 1900.*

Age Classification.	1900.	1850.
Under 1 year	2.	2.1
1 and under 5 years	7.6	9.9
5 and under 50 years	69.0	73.9
50 and over years	21.4	14.1

* The age statistics of the Census of 1910 are not yet available.

The significant changes which occurred during the half-century from 1850 to 1900 are the decreased proportion of young children under five years of age, and the increase in the number of elderly persons.

In 1850, for every 1,000 persons above the age of five years there were 134 below that age; in 1900 the number was 106. At the other extreme, in 1850, for every 1,000 persons under fifty years of age, there were 164 persons above that age, but in 1900 this number had advanced to 272. The proportion formed by elderly persons thus advanced from 14.1 per cent. in 1850 to more than one fifth of the total population of the state in 1900. In some counties, indeed, it rises to one quarter.

While these changes in themselves are worthy of serious consideration, the question at once arises, did the entire United States experience such a noteworthy shrinkage in the proportion of young children and in the increase in proportion of elderly persons during the half century from 1850 to 1900, as was shown by Vermont.

TABLE X.

COMPARISON OF THE PROPORTION OF POPULATION IN SIMILAR AGE PERIODS IN THE UNITED STATES AND VERMONT, 1850 AND 1900.

Age Period.	Per Cent. Population in Specified Age Groups.									
	Total Population.				Native White.				Native White Native parents.	
	United States.		Vermont.		United States.		Vermont.		United States.	Vermont.
	1900.	1850.	1900.	1850.	1900.	1870.	1900.	1870.	1900.	1900.
All ages.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under 1 year.....	2.5	2.7	2.0	2.1	2.9	3.4	2.2	2.5	2.8	2.1
1 and under 5 years....	9.5	12.4	7.6	9.9	11.0	13.1	8.6	10.1	10.5	8.0
5 and under 50 years...	74.5	75.9	69.1	73.9	75.0	73.7	69.4	69.1	73.1	66.5
50 years and over.....	13.2	8.9	21.1	14.1	10.9	9.8	19.6	18.3	13.3	23.3
Unknown age	0.3	0.1	0.3	*	0.2	*	0.2	*	0.3	0.2

* Less than one tenth of 1 per cent.

Upon analysis, it appears that for the nation the number of young children to each 1,000 of the remainder of the population, was 177 in 1850 and 136 in 1900, and of elderly persons 99 in 1850, and 186 in 1900. If the percentage of the total population formed by young children in Vermont, were applied to the entire nation, there would have been 1,874,628 less children under five years than were actually counted, and instead of about ten million elderly persons (above the age of fifty years), as actually shown by the census, there would have been nearly sixteen millions.

It is thus obvious that Vermont is not maintaining the national proportion of young children, but instead, at the other extreme, shows a decided excess of persons over fifty years of age. These conditions are the result of decreased fertility and emigration of a sufficient number of younger members of the community to reduce the birth rate and increase the proportion of older persons. Here is statistically shown an important factor in retarded or decreasing population.

NATIVITY.

The departure of persons born in Vermont to take up their residence in other portions of the United States, in all probabil-

ity has been greater and distributed over a longer period of time than similar emigration which has occurred from any other state in the Union. The federal census analysis of population by states of birth indicates a larger proportion of the natives of Vermont resident in other states and territories than that reported by any other state.

TABLE XI.

PROPORTION OF ALL NATIVES OF VERMONT FORMED BY THOSE RESIDING ELSEWHERE, 1850–1900.

Year.	Total Natives of Vermont.	Residing Elsewhere.	
		Number.	Per Cent.
1850	377,741	145,655	38.6
1860	413,852	174,765	42.2
1870	420,978	177,164	42.1
1880	430,041	178,261	41.5
1890	422,359	172,769	40.9
1900*	416,672	168,542	40.4

* Continental United States.

The percentage of non-resident natives of Vermont has remained fairly constant from 1850 to 1900; practically but 61 per cent. of the natives of Vermont reside in the state of their birth.

Considered by geographic divisions the natives of the various states of the Union migrated from the state of their birth in the following proportions:

TABLE XII.

PROPORTION OF NATIVES OF ALL STATES BY GEOGRAPHICAL DIVISIONS, RESIDING OUTSIDE STATE OF BIRTH, 1850 AND 1900.

Geographic Division.	1850.	1900.
North Atlantic	13.1	11.1
New England	16.1	12.1
Southern North Atlantic	16.7	13.7
South Atlantic	25.3	12.3
North Central	3.3	8.6
South Central	14.7	6.8
Western	0.8	4.8

It is clear that the proportion of 40.4 per cent. of all natives of Vermont formed by those living outside of the state, is

far larger than that shown by other states. It indicates either unusual restlessness, or ambition, or a belief that because of climate or other conditions, opportunities for success in agriculture, business, and the professions are fewer in Vermont than in other parts of the Union. The third of these suggested causes is doubtless the prevailing motive for removal from the state. Since the tendency of this period is strongly toward desertion of the farm, wherever it may be located, for the excitement and larger opportunity of the city, it is, in truth, no discredit to Vermont that so many of her children respond to the spirit of unrest and ambition and desert her fields. In other states much of this transfer occurs from country to city within the state. Vermont, however, of all the northern states is by far the most distinctly rural. Possessing no large cities, it is natural to expect that Vermont should show most clearly the drain to which small towns are subjected. While some significance may attach to the fact that the proportion of natives of Vermont resident elsewhere is not increasing, it is probably due to the slowly decreasing ability of the state to maintain the numbers of her absent children scattered all over the Union.

In 1850 much the larger proportion of Vermonters who left their native state located in New York. In fact, those who made that state their objective represented more than one third of the entire number. The second largest group, practically equal in number to those who went to the middle Atlantic states, settled in the group comprising Ohio, Indiana, Illinois, Michigan, and Wisconsin. A negligible number resided in the southern states, and but a small proportion, at that early period, had penetrated further west than Iowa. In 1900, although the total number of natives of Vermont residing elsewhere had increased approximately 25,000 over the figure reported in 1850, the number of Vermonters found in New York was considerably less than half the number of those who resided in that state in 1850, while the number remaining in New England outside of Vermont, had more than doubled. The number of Vermonters in Massachusetts rose from less than 18,000 in 1850, to more than 40,000 in 1900, in Connecticut had more than tripled, in Rhode Island quintupled, and

had also nearly doubled in the adjoining state of New Hampshire. Emigration of Vermonters likewise increased materially during the half-century which elapsed from 1850 to 1900, to the groups of southern and southwestern states, and showed its largest proportion of increase in the far western states, including those upon the Pacific coast.

The departure of natives of Vermont cannot be properly considered, without observing the entrance into the state of natives of other states.

It appears that for every 1,000 persons who departed from Vermont in 1850, 335 entered it for purposes of residence. In 1900, for every 1,000 natives who departed, 300 natives of other states took up their residence in the state. The proportion, therefore, of those born elsewhere in the United States who are substituted in Vermont for native population, has obviously decreased.

In 1850, five sixths of the total number of those who entered the state were born in the other New England states. Most of the remainder were born in New York. Natives of other states were so few as to be negligible in number. In 1900, curiously enough, the proportions shown in 1850 were completely changed. Less than half of the total number entering the state were born in the other New England states. For example, the proportion from New Hampshire was less than half that shown in 1850, from Massachusetts was scarcely more than half, and the decrease for the other states was almost as great as the increase which occurred in the number of native Vermonters removing to those states, and to which attention has already been called. On the other hand, natives of New York, who in 1850, formed a small proportion of the total of Vermonters born elsewhere, had increased in 1900 to nearly half of all natives born elsewhere, while all the other portions of the country, including the southern and central western states, contributed an appreciable proportion in 1900 of the total population of Vermont not born in that state.

In this connection it is of interest to note the following table:

TABLE XIII.

PROPORTION OF TOTAL NATIVES OF UNITED STATES RESIDING IN VERMONT FORMED BY THOSE BORN IN OTHER STATES, 1850–1900.

Year.	Total Natives of United States Residing in Vermont.	Natives Born Outside of Vermont.	
		Number.	Per Cent.
1850	280,966	48,880	17.4
1860	282,256	*43,169	15.3
1870	283,388	*39,574	14.0
1880	291,325	†39,545	13.6
1890	287,384	‡37,794	13.2
1900	295,859	§47,729	16.1

Of the total natives of the United States resident in Vermont, those who were born outside of the state slowly decreased in proportion to and including 1890, but showed a marked increase in 1900, almost resulting in the 1850 proportion.

FOREIGN BORN.

In view of the immense increase of the foreign born population of the United States, especially in the eastern states, the proportion formed in Vermont by this element is of especial interest.

TABLE XIV.

PROPORTION OF TOTAL POPULATION OF VERMONT FORMED BY NATIVES IN STATE, BY NATIVES FROM OTHER STATES, AND BY FOREIGN BORN, 1850–1900.

Year.	Total Population.	Percentage of Total Formed by		
		Natives of State.	Natives of Other States.	Foreign Born.
1850	314,119	73.9	15.7	10.4
1860	315,098	75.9	13.7	10.4
1870	330,551	73.8	11.9	14.3
1880	332,286	75.8	11.9	12.3
1890	332,422	75.1	11.7	13.2
1900	343,641	72.2	14.7	13.1

* Exclusive of population born in United States, state or territory not specified, and born at sea under United States flag.

† Exclusive of Alaska, and born at sea under United States flag.

‡ Exclusive of Alaska, born in United States, state or territory not specified, and American born citizen abroad.

§ Continental United States.

Contrary to the prevailing tendency, especially evident in the other eastern states, the proportion formed by the foreign born element in Vermont has increased but little from 1850 to 1900. Forming about 10 per cent. of the population at the former Census, the foreign born represented but 13 per cent. at the latter. The population of Vermont born in the state thus has maintained its strength almost unchanged against the foreign born for a period of fifty years, and still continues to comprise practically three fourths of the entire population, but in the United States the proportion has doubled. Taken with the other element of native population (natives of the United States resident in Vermont but born elsewhere), the two native elements comprised in 1900 87 per cent. of the total population of the state. This is a much larger proportion than is shown elsewhere in the United States, except in the southern and southwestern groups. It may be illustrated by the fact that if Massachusetts had no larger proportion of persons of foreign birth in her total population than Vermont has shown for many years, the number of inhabitants in Massachusetts in 1910 would only approximate the actual number reported twenty years earlier.

Of the total foreign population of Vermont in 1850, approximately half were born in Ireland, and most of the remainder was contributed by what was probably the English Canadian element. So large, indeed, was the contribution of these two countries, that they together formed approximately 30,000 out of 33,000 foreign born. In 1900, these proportions had undergone a material change. The number of persons born in Ireland, living in Vermont, was less than half that reported in 1850, and the prominence of the English Canadian stock had given place to French Canadian, while a dozen other nations contributed appreciable numbers. Italy, for example, which was credited with but seven inhabitants of Vermont in 1850, was represented by more than 2,000 in 1900.

TABLE XV.

DISTRIBUTION OF PERSONS BORN IN SPECIFIED COUNTRIES, RESIDING IN VERMONT, 1850–1900.

Country of Birth.	1850.	1860.	1870.	1880.	1890.	1900.
Total population	314,119	315,098	330,551	332,286	332,422	343,641
Born in foreign countries	32,830	32,743	47,155	40,959	44,088	44,747
England and Wales	1,603	2,016	2,511	2,767	4,477	3,503
Ireland	15,377	13,480	14,080	11,657	9,810	7,453
Scotland	1,045	1,078	1,240	1,006	1,730	2,049
Germany	224	218	370	396	877	882
France	40	71	93	138	175	171
Italy	7	13	17	30	445	2,154
Austria	....	1	2	5	59	237
Russia	1	7	1	8	153	377
Norway, Sweden, and Denmark	8	4	138	113	966	1,299
Canada English	14,470	15,776	28,544	24,620	*25,004	10,616
Canada French						14,924
All other foreign born	55	79	159	219	392	1,082
Born in United States	280,966	282,355	283,396	291,327	288,334	298,894
Birthplace unknown	323	....	....	....	....	.....

* Includes Newfoundland.

Per 10,000 Distribution.

Total population	10,000	10,000	10,000	10,000	10,000	10,000
Born in foreign countries	1,044	1,038	1,428	1,230	1,324	1,306
England and Wales	51	64	76	84	135	102
Ireland	490	428	426	351	295	217
Scotland	33	34	38	30	52	60
Germany	7	7	11	12	26	26
France	1	2	3	4	5	5
Italy	†	1	1	1	13	63
Austria	....	†	†	†	2	7
Russia	†	†	†	†	5	11
Norway, Sweden, and Denmark	†	†	5	3	29	39
Canada English	461	501	864	741	*752	309
Canada French						434
All other foreign born	1	1	4	4	10	33
Born in United States	8,946	8,962	8,572	8,770	8,676	8,694
Birthplace unknown	10	....	....	....	....	.....

† Less than 1 in 10,000.

It will be observed that from 1890 to 1900, the total number of white natives who were themselves the children of natives, of which class the population of the state is principally composed, remained stationary (increasing but 136). Moreover, the number of foreign born also remained stationary (increasing but 670). Hence practically the entire increase which occurred in the population of the state during the decade was contributed by the foreign element, whose offspring, "native born of foreign parents" increased more than ten thousand, or nearly 25 per cent. of the foreign born element.

TABLE XVI.

NUMBER OF PERSONS AND PROPORTION OF THE POPULATION OF VERMONT CONTRIBUTED BY THREE ELEMENTS, 1890 AND 1900.

	Population of Vermont.			
	Number.		Per Cent. of Total Population.	
	1890.	1900.	1890.	1900.
Total	332,422	343,641	100.0	100.0
Native white	287,394	298,077	86.5	86.7
Both parents native	225,245	225,381	67.8	65.6
One or both parents foreign born	62,149	72,696	18.7	21.2
One parent foreign born	*	38,239	*	11.1
Both parents foreign born	*	34,457	*	10.0
Foreign born white	44,024	44,694	13.2	13.0
All other	1,004	870	0.3	0.3

* No figures in 1890.

Here again is another factor of importance in the problem of stationary population. We have observed the decreased fertility of the Vermont population, which is principally native. The foreigner, on the other hand, is prolific, but does not form a sufficiently large proportion of the total to exert the important influence upon increase of population manifested in other states, where the foreign born form a large part of the population. Had persons of foreign birth formed the same proportion of the Vermont population as they formed of that of Massachusetts, Rhode Island, and New York they would have increased the population of the state 25,000 and the second generation of this element would have swelled this increase materially.

VI. Agriculture in Vermont.

In the face of industrial changes which have revolutionized the other New England states, the population of Vermont has continued largely dependent for support upon the products of the soil. During the sixty years which elapsed from 1850 to 1910, the number of farms increased about 10 per cent., but the number of acres improved decreased approximately 1,000,000. The average, therefore, of improved acres per farm apparently decreased from 87.4 in 1850 to 50.0 in 1910.

TABLE XVII.

AGRICULTURE IN VERMONT. NUMBER OF FARMS AND ACRES IMPROVED, 1850–1910.

Year.	Number of Farms	Acres Improved.
1850	29,763	2,601,409
1860	30,976	2,823,157
1870	33,827	3,073,257
1880	35,523	3,286,461
1890	32,573	2,655,943
1900	33,104	2,126,624
1910	32,598	1,632,803

From 1850 to 1900, three counties, Essex, Grand Isle, and Lamoille, all in the northern tier of counties, showed an increase, and the principal declines occurred in the lower river counties of Windham and Windsor. These two counties contributed approximately 335,000 (or more than half) of the total decrease in improved acreage. The river counties as a whole decreased from nearly 1,200,000 acres improved to approximately 800,000, or one third, a considerably higher proportion than that shown by the remainder of the state.

From 1900 to 1910, however, all counties except Grand Isle reported decrease in improved acreage. Moreover, the proportion of decrease was in general similar throughout the state. Little weight, however, should be given to the census figures for improved acreage. In 1910, sharp decreases appear in all the New England States, suggesting that a change occurred either in method of enumerating, or what is more probable, in responses to the census inquiry. Farmers are doubtless becoming stricter in deciding what "improved acreage" really is.

According to the returns of the census of 1910, Vermont farm lands have increased in value during the decade $12,440,908, or over 25 per cent., while during the same period farm buildings increased $16,814,453, or nearly 45 per cent. Accepting these returns as reasonably accurate, the average value of a Vermont farm was $2,591 in 1900, and $3,415 in 1910.

In 1910 there were ninety-two farms in Vermont to every 1,000 persons, as compared with ninety-seven in 1900. No marked change in this proportion occurred in more than half

a century, for the proportion of farms to each 1,000 inhabitants in 1850 was ninety-five. For each 1,000 families in Vermont in 1900, there were 409 farms. This proportion clearly suggests the importance of agriculture as a state industry. In Iowa, which is classed as a conspicuously agricultural state, the number of farms in 1900 to each 1,000 families, was 475.

The value of all farm products in 1910 had not been reported by the census when this paper was being prepared.

TABLE XVIII.

VALUE OF AGRICULTURAL PRODUCTS IN VERMONT, BY COUNTIES, 1880–1900.

County.	1900.	1890.	1880.
The State	$21,994,302	$20,364,980	$22,082,656
Addison	1,856,632	1,797,760	2,050,086
Bennington	1,159,718	1,044,800	994,123
Caledonia	1,812,902	1,609,000	1,683,649
Chittenden	1,725,179	1,691,470	1,827,591
Essex	540,323	460,520	424,526
Franklin	2,123,643	1,940,240	2,449,507
Grand Isle	324,848	298,770	336,560
Lamoille	900,206	891,590	974,931
Orange	1,737,560	1,708,620	1,897,523
Orleans	2,036,705	1,776,680	1,817,065
Rutland	2,191,581	1,823,910	2,095,392
Washington	1,830,502	1,919,800	1,819,724
Windham	1,726,416	1,483,400	1,484,328
Windsor	2,028,087	1,918,420	2,227,651

In Windham and Windsor counties, which were previously noted as showing marked decline in improved acreage from 1850 to 1900, the aggregate value of agricultural products remained practically unchanged from 1880 to 1900. For the River Counties, a slight increase in total value occurred.

Decrease in improved farm acreage in Vermont, without corresponding decrease in value of farm products, results in a marked change in the average value per acre. This average, which in 1880 was $6.72, had advanced in 1900 to $10.34. The average value of products, not fed to live stock, per farm in 1880 was $622; in 1900, $669.

It is probable that the acreage under cultivation in the state might be further reduced materially, and with corresponding increase in systematic and intensive cultivation, the value of the products would continue to advance. While

opportunity exists for increased activity in manufactures and quarrying, undoubtedly the opportunities for the present and succeeding generations of the citizens of the state lie in the cultivation of the soil, and with an immense increase in urban population in the other eastern states, the opportunity for profitable return from agriculture in Vermont unquestionably increases annually. Unfortunately the value of agricultural products by towns is not compiled by the Census. These figures, if obtainable, would be of great value to the state in any systematic effort to increase agricultural products.

VII. Manufactures.

Attempts to report value of manufactures in the United States were made from time to time at the early censuses, but were inaccurate and misleading. In 1810, for example, it was reported that the total value of manufactured products in the state amounted to approximately two and one-half million dollars. In 1820 they were reported at scarcely more than eight hundred thousand dollars, with several counties missing. These figures probably possess little value, but the former is of interest as suggesting the extent of "household industries," at that period. Even in 1810, however, manufacturing in homes was beginning to decline rapidly as manufacturing in establishments became more general.

In 1850, the first systematic effort to secure statistics of manufactured products was made, but the returns have increased in accuracy at each succeeding census.

TABLE XIX.

NUMBER OF MANUFACTURING ESTABLISHMENTS IN VERMONT. AND VALUE OF PRODUCTS, 1850–1900.

Year.	Number of Establishments.	Value of Products.
1850	.....	$8,570,920
1860	1,883	14,637,837
1870	3,270	32,184,606
1880	2,874	31,354,366
1890	3,031	38,340,066
1900	4,071	57,623,815

TABLE XX.

VALUE OF PRODUCTS PER MANUFACTURING ESTABLISHMENT IN VERMONT AND PER 1,000 POPULATION, 1850–1900.

Year.	Per Establishment.	Per 1,000 Population.
1850	.....	$27,285
1860	$7,774	46,455
1870	9,842	97,367
1880	10,910	94,360
1890	12,649	115,336
1900	14,155	167,686

The decided increase which occurred in 1900 as compared with the increase shown as previous censuses is of much significance. This increase occurred in every county of the state except Essex, which showed a heavy decrease from 1890 to 1900, reflecting the falling off of timber products, doubtless resulting from the destruction of forests, which had been in progress in that county.

The general increase elsewhere from 1880 to 1900, while largely due to industries allied to quarrying, suggests the rise of miscellaneous manufactures and the influence upon Vermont of the great manufacturing interests of other New England states. There has obviously been a tendency during the twenty years in question, to establish manufacturing plants in many sections of the state possessing reasonable railroad facilities, partly because of the general and remarkable growth of manufactures in all parts of the Union, and partly to take advantage of the unexcelled water powers to be found in many localities in Vermont. The completion of several important engineering projects during the past decade, to secure increased power, has undoubtedly further stimulated industrial enterprise.

MANUFACTURES IN 1905.

The Federal Census of Manufactures taken in 1905 omitted all "hand industries" (such as cobblers, repair shops, etc.), and presented returns only for manufacturing "in establishments." The line was thus drawn (and wisely) between a class very large numerically, but in a broad sense not "manu-

factures" and the real industrial interests. This classification excluded more than half of the Vermont establishments enumerated in 1900, but of course reduced the value of products reported by the state to a much less degree. Fortunately, it is possible to separate hand industries from all others in the returns for 1900, but the figures are available as a state aggregate only, and not by counties. In 1905, the total value of manufactures in establishments in Vermont was $63,083,611. The similar figure in 1900 was $51,515,228. The number of establishments were 1,699, and 1,938 respectively. Hence the average value of products in 1905 per establishment was $37,132, compared with $26,585 in 1900.

In 1905 the eight leading industries in the state in the order of value of products were these:

Industries.	Value of Products.	
	1905.	1900.
Total	$42,950,483	$34,151,984
Stone manufacture	9,570,436	6,380,414
Textiles	7,773,612	5,417,217
Butter and cheese	6,416,434	5,500,545
Lumber and timber	5,888,441	5,940,610
Paper and wood pulp	3,831,448	3,384,773
Flour and grist mills	3,206,075	2,769,648
Foundry and machine shops	3,183,920	2,170,196
Lumber mill products	3,080,117	2,598,581

This table is significant in two particulars: these eight industries contribute three quarters of the value of products of all Vermont factories and shops; the value of lumber and timber products and that of the lumber mills both lost rank during this five-year period, a fact which doubtless reflects the decreasing yield of Vermont forests.

In any survey of the material resources of Vermont it should not be overlooked that there is much accumulated wealth throughout the state, not only inherited from earlier generations of shrewd and frugal men and women, but acquired also by the present population. In few states is the entire body of citizens so free from want.

In general, the extremes of poverty and wealth, both of which are becoming more and more evident in other states, especially in those having large industrial population, are in Vermont practically unknown.

VIII. Summary and Conclusion.

Having thus reviewed certain aspects of population and industrial change in Vermont, it will be of interest briefly to summarize the more important facts which have been developed.

The population of Vermont increased four-fold from 1790 to 1910. The national increase was twenty-two fold. If the population of the United States had increased during the entire period of federal census-taking at the same rate as that shown by Vermont, the Republic would contain in 1910, but 16,500,000 inhabitants, instead of approximately 92,000,000. Vermont had attained most of her population growth (thus far) by 1830. From thatd ate to the present time, the state has increased in number of inhabitants about 75,000, or less than 1,000 per annum.

The group of lower counties recorded an almost continuous decrease from 1850 to 1910. Such increase as occurred in the population of the state during that period was contributed by the upper counties. Since the early part of the nineteenth century, the population tendency of the majority of Vermont towns, wherever located, in general, has been downward. Some towns began to lose population by 1810; one sixth showed decrease in 1830; the proportion of towns decreasing grew until 1890, when three quarters reported decrease. In 1910, approximately two thirds of all towns reported less population than in 1900; but 80 towns out of 254 returned larger population than was shown at the census of 1850.

One hundred and twenty-nine towns reached maximum population prior to 1850, and 121 afterward.

But one eighth of all the towns and cities in the state reported maximum population in 1910. This small group consists principally of cities and large towns. In general, the small towns in Vermont attained maximum population during the first half of the nineteenth century.

If all the towns in the state had reported in 1910, the maximum population which they showed at any census, the population of Vermont would be 101,910 greater than was actually reported.

Ten towns, those which in 1910 reported population exceeding 5,000, furnished all the increase which occurred in the population of Vermont from 1850 to 1910, and in so doing made good a loss of 27,261 occurring in the remainder of the state. Upon one twenty-fifth, therefore, of her towns and cities, Vermont has depended not only for such population increase as has occurred during 60 years, but for the prevention of actual loss during that period.

In 1850 there were 115 towns in Vermont in the class of communities having between 1,000 and 2,000 inhabitants, and they contained more than one half of all the population of the state; in 1910, there were less towns in this class, and they returned but one quarter of the total population. In 1850 there were 98 towns having less than 1,000 inhabitants; in 1910 this number of towns was greater by 45. These changes result from the transfer of towns classified in 1850 in the higher population class, to the lower one in 1910. The only group of towns which maintained proportions similar, both in number of towns and in their aggregate population, in 1910, as compared with the returns for 1850, was that of communities having from 2,000 to 4,000 inhabitants. The group showing decided increase was that which comprised towns and cities exceeding 7,500 population. The towns which have shown greatest population prosperity in Vermont are the larger ones. These appear to have thrived principally at the expense of smaller communities.

For more than a half-century small Vermont towns in most instances have been growing smaller in population, and the large towns have been growing larger, with their aggregate increase a little more than sufficient to counter-balance the loss shown in the former class.

In 1850 the proportion of children under five years of age was 134 to every 1,000 persons above that age; in 1900 the proportion was 106. In 1850 the proportion of elderly persons (over fifty years of age) was 164 to every 1,000 persons below that age, but in 1900 the proportion was 272. In 1910 more than one fifth of the total population of the state was fifty years of age and over.

The disparity between these proportions and those shown

by the entire United States is shown by the fact that if the Vermont proportions were applied to the nation, there would have been in 1900 approximately 2,000,000 less children and 6,000,000 more old persons in the republic than were actually reported. The number of persons in Vermont below the age of fifty years increased but 345 souls from 1850 to 1900. Therefore all the increase in Vermont's population, when analyzed by age groups, occurred in the class of elderly persons.

In 1900 of all the persons born in Vermont, 60.6 per cent. resided in the state and 39.4 per cent. resided elsewhere. These proportions showed practically no change from those reported in 1850. A larger proportion of Vermonters have left their native state to reside elsewhere than is shown by natives of any other state in the Union. In 1850 a majority of Vermonters who left the state to reside elsewhere, settled in New York. In 1900 a majority settled in other New England states, and the remainder are scattered throughout the Union.

Residents of Vermont born elsewhere in the United States, form less than one fifth of the entire population of the state. This class showed practically no change in proportion or in absolute number from 1850 to 1900. For every 1,000 native persons who had departed from Vermont in 1850, 335 had entered the state for purposes of residence; this proportion declined in 1900 to 300. In 1850 five sixths of all those born in other states who became residents of Vermont, were drawn from other New England states. In 1900 less than one half were born in the New England states, and nearly one half were born in New York.

While the foreign born in the United States increased five-fold from 1850 to 1900, in Vermont this class of population fell short of doubling, and continued to form roughly the same proportion of the state's total population that it did in 1850. Of the foreign born as reported in 1850, the greater part were Irish and English-Canadians; in 1900 the French-Canadians formed the largest element, and the remainder was composed of many nationalities.

From 1890 to 1900, the number of native whites of native

parents and the number of persons born in foreign countries, remained stationary; such increase as occurred in the state's population during the decade (approximately 10,000) appeared in the class "Native Born of Foreign Parents." Hence the foreign element in Vermont, but 44,000 in number, contributed all the increase that occurred in the state's population, or nearly 25 per cent. of their own number. Had persons of foreign birth formed the same proportion of Vermont's population as they formed of that of Massachusetts and other eastern states, the fertility of this class would have enabled the state to increase in population to a degree approximating that of many other states in the Union.

The farms of Vermont increased about 10 per cent. in number from 1850 to 1910; the number of acres improved decreased nearly one million. This decrease occurred in all counties except one.

The value of agricultural products in the state increased about 10 per cent. from 1890 to 1900, but was slightly less in the latter year than in 1880. The average of acres improved per farm decreased from 87.4 in 1850 to 50.2 in 1910, but upon the decreased acreage the value of agricultural products was maintained, so that the average value per acre, which in 1880 was $6.72, increased in 1900 to $10.34. For the United States, the figures were about $9.00 in 1880 and $12.60 in 1900.

In 1880 there were 2,874 manufacturing establishments in Vermont, in 1900, 4,071. The value of products increased from approximately $32,000,000 to $57,500,000. Hence the average value of products per establishment advanced from $10,910 to $14,150. In the entire United States the average was $21,136 in 1880 and $25,300 in 1900. Substantially all the counties in Vermont, except Essex, showed a decided increase in the value of manufactured products from 1890 to 1900. The increase shown in the number of industrial establishments and the value of their product, thus proves much greater than the increase in agriculture, suggesting that such advance as the state has of late years made, is to be found to a greater degree in manufacturing than in farming.

It is obvious that analysis of the population and industrial

changes which have occurred in Vermont, does not reveal decided progress in any direction. Vermont possesses no seacoast to invite commercial opportunity, and no waterway facilities except those afforded during part of each year, by Lake Champlain. Geographically, the state lies on the northern border, remote from main-travelled national highways. The climate, though exceedingly healthful and invigorating, is severe in winter, and in this period of national history, when personal comfort is an important factor in determining residence, the rigorous Vermont winter undoubtedly has tended to discourage immigration.

Other Commonwealths similarly situated geographically, or possessing an equally cold climate, have the advantage of soil of unusual richness adapted, like that of the Dakotas, to the raising of grain upon a gigantic and highly profitable scale, or of mineral deposits like those of Montana, immense in extent, variety, and value. Vermont soil has been long cultivated, and her mineral resources consist principally of marble and granite.

For these and other reasons, some of which undoubtedly reflect the enduring influence of the fathers, the state has not progressed along the same lines followed by other commonwealths, but in many respects has gone counter to clearly defined national tendencies. In Vermont the traditional vocation of agriculture has been a principal means of livelihood, as it was, indeed, in all New England a century ago. The other New England states, however, long since turned toward manufactures as their principal reliance for prosperity and population. Moreover, Vermont has maintained reasonable purity of stock in the face of extensive racial changes elsewhere,—changes which in the other New England states have been so great as to transform the population characteristics of large communities.

In consequence of these policies, which are often termed reactionary, and generally accepted as non-progressive, Vermont has contributed during the past century, a large share of strong men and women to the upbuilding of new commonwealths, but in doing so has lost a large element which in other states would have remained at home.

It is not to be expected in any state, however favorably it may be situated, that all civil divisions will show maximum population at each successive census. Somewhat as a coast line advances or recedes through a period of years under the stress of tides and storms, so population lines change under the influence of trade and economic and physical conditions. Moreover, it is now well understood that large numbers of New England farms, ill-located or upon sterile lands, should never have been improved. That they were, reflected the population pressure which existed at a period when there was no other recourse but farming, when household industries were an important source of revenue, and when, indeed, men and women lived simply, reared large families, and demanded little. These economic conditions permanently changed when household industries declined and the fertile lands of the West and Southwest called for development and were made accessible by improved means of transportation. It is not surprising, therefore, that Vermont (which should have been the fourteenth original state), contributor to so many other commonwealths, should grow slowly, or show many decreasing communities.

It is important to observe that these population conditions are not confined to Vermont. Over the North and West appears of late to have swept a great discontent with the farm, its dull routine and seemingly limited opportunity. The Thirteenth Census reflects the change evidently in progress in many states. Iowa, which has always been classed with Vermont as a distinctly agricultural state, has transformed the 16 per cent. increase which occurred from 1890 to 1900, into an actual decrease in 1910. In Missouri, which borders upon the South, a geographical area hitherto little affected by the movement cityward, out of 115 counties, 70 decreased in population from 1900 to 1910. In all the New England states, in central and western New York, parts of Pennsylvania, and much of the Middle West the same tendency is evident. Vermont, therefore, is not alone in facing the problem of decreasing rural population, but unfortunately the state has no large cities to sustain general prosperity and to form an aggressive center of state wealth, ability,

and enterprise, so that the discontented generally are not attracted to cities within their own state, but overstep the borders. Moreover, while similar population movement elsewhere, such as that in Iowa, Indiana, and Missouri, is of recent origin, decrease in Vermont has been shown in this paper to have been in progress for many years. When, therefore, allowances have been made to account for the slow progress of Vermont, it must be admitted that much remains in the present population and material condition of the state to justify serious concern.

The permanent welfare of every state demands that most of the communities of which they are composed should give, at least, reasonable evidence of maintenance of population. In Vermont, one sixth of all the towns and cities have decreased in 1910 to half or not much more than half the population they possessed about the middle of the last century. Geographical areas, however, have not decreased, and the demand for good roads and for good schools is now even more insistent than in the days of population prosperity. Hence, for many of these decreasing communities, the problem of maintenance of public expenditures must have become exceedingly serious.

If the decrease in population shown from 1900 to 1910 in 166 towns is to continue at the same rate (and expectation that it will is fully justified by the analysis of change presented in this paper), by 1950 a considerable number of the state's civil divisions will be reduced to less than 100 inhabitants. In fact, application of the present percentage of decline leaves several towns without any population by the middle of this century. If this should actually occur, a century and a half will have witnessed the settlement, development, decline, and extinction of these communities. But it is probable that there will not be many towns, from which population will completely disappear. For all practical purposes, however, from the economic standpoint, a town becomes almost a blank when, having once been of some consequence, it is reduced to a condition in which the community can barely sustain itself and hence can contribute no strength to the state either in numbers, mental power, or wealth. This

is the result to be feared in many instances in Vermont. In some respects depopulation is to be preferred.

Statistical analysis of population conditions in Vermont strongly suggests that the state will reach a crisis in connection with this subject within a few years,—if it has not already arrived.

A town having considerable population, especially if composed principally of intelligent and progressive people, can spare, if necessary, a moderate proportion of its citizens. The task which one man lays down, another takes up. Hence, at the beginning of their period of decrease many Vermont towns sustained losses without showing distinct evidences of decline. When, however, the number of inhabitants in a town at length has become reduced from more than one thousand to a few hundred, and when those who have gone, by their very going, create the presumption that they were the more virile and energetic element, then to the small remaining population each new departure is like a blow in the face, and the community is proportionately more and more crippled as the next useful citizen dies or departs. After a long period of decrease, this is the condition which confronts many Vermont towns at the present time.

Possibly this condition is reflected to some extent in the failure of Vermont of late years to become prominent in manufacturing, although all the other states in the New England sisterhood have achieved industrial success. At the period when the Vermont small towns were in their population prime, agriculture was everywhere the principal occupation. The subsequent drain of strong and resourceful citizens to other states near and far left large numbers of Vermont communities ill equipped to venture into manufacturing enterprises, since these to succeed require exactly the qualities which emigration had begun to withdraw long before manufacturing became of much consequence anywhere in New England. This comment of course does not apply to the numerous towns and cities which have proved their participation in New England enterprise and inventive and commercial genius, but relates to the large number in which each census records decreasing population.

Furthermore, over a community which is thus steadily losing strength, there creeps an atmosphere of discouragement and hopelessness, and the boys and girls who are born into such a community grow to maturity with the settled conviction that their home town is "dead," and that their own claim to progressiveness is dependent upon departure. Already in many towns, energy and progress, as those words are understood in big, stirring communities, are practically unknown. An ominous proportion of the population are not resourceful and virile. Often such persons have sunk into slack and unhealthful ways of living, and in consequence in their families the rising generation shows a distinct decline, but more often nature decrees that they shall have no successors.

While it is true that the population returns for Vermont offer to the student perhaps the gloomiest statistical picture to be found at the present time in the United States, the state is still very far from material or population catastrophe, and unquestionably still possesses in her own people the remedy for many ills.

Historical narrative is often out of place in a statistical paper, but the sketch of the early trials of the state of Vermont, which appears at the beginning of this study, was included with a definite purpose. The story of the New Hampshire Grants is a record of extraordinary persistence, self-restraint, and sagacity on the part of the leaders and people of that period. By the patient exercise of these qualities, complete success was achieved. The population of Vermont in 1910 is more than six-fold greater than it was in 1785; the number of present-day Vermonters possessing in full measure the fine traits of the fathers, is much greater than the number of those who shaped the early destinies of the state. It is a significant fact that in a recently issued and authoritative publication presenting biographical sketches of more than 17,000 Americans who are considered to have attained greatest eminence in all walks of life and in all callings, Vermont is near to leading the sisterhood of states in the proportion of persons so included to each 1,000 persons born in the state.

The modern Vermont problem differs sharply from the

earlier one. It is not a matter of arms and diplomacy, yet it requires exactly the qualities which the fathers manifested. The state is naturally fertile; waterpower abounds; forests with proper conservation should be a source of continued wealth. The scenery is beautiful to a degree surpassed by few states in the Union, the climate, though severe, is most healthful and invigorating. Hence in this period of rising prices for staples of food and of congested urban population seeking the pure air of the hills, is not the opportunity of Vermont at hand?

The ultimate purpose of all statistical analysis should be constructive; this paper will have failed if it has not made plain the fact that continued drifting in Vermont unquestionably means the weakening of state vitality to the point where remedies may not avail. This extreme condition has by no means arrived in 1911.

Elsewhere in this paper it has been pointed out that measured by statistical change, definite increase occurred in Vermont in but two particulars: in one element of population,—because of the fertility of the foreign born, and in manufactures,—shown by the value of products. These two elements of strength are exceedingly significant. The pathway to population and wealth by utilizing the foreigner and the factory, has been trodden to a highway by most of the other states of the Union. Either by accident or the temperament of the people, Vermont has paid small heed to either of these modern means of securing prosperity. Whether it is permanent prosperity, is another matter, and need not be discussed here.

If the influential and able element in the state should organize and address themselves with unity, energy, money, and enthusiasm to the task of encouraging native Americans to settle in the more fertile areas, should seek outlets for their products, develop resources, and start new industries, it is reasonable to suppose the state would promptly respond in population and prosperity in proportion to the effort. In this undertaking, it should not be overlooked that there is an army of 168,000 allies in the Vermonters in other states, scat-

tered indeed, all over the Union, but possessing an undimmed love for the fatherland.

Success in any movement to solve the state's present day problem seems to lie first in organization. By organization all things are achieved in this age.

If public opinion in the state favors the modern policy of conservation, let it be remembered that today there is no conservation so vitally important to the state of Vermont as the conservation of strong and resourceful men and women.

1. TOWNS IN WHICH MAXIMUM POPULATION WAS ATTAINED IN 1810 OR EARLIER.

2. TOWNS IN WHICH MAXIMUM POPULATION WAS ATTAINED IN 1830 OR 1840.

3. TOWNS IN WHICH MAXIMUM POPULATION WAS ATTAINED IN 1850 OR 1860.

4. TOWNS IN WHICH MAXIMUM POPULATION WAS ATTAINED IN 1870 OR 1880.

5. TOWNS IN WHICH MAXIMUM POPULATION WAS ATTAINED IN 1890 OR IN 1900.

PROCEEDINGS OF THE SEVENTY-SECOND ANNUAL MEETING OF THE AMERICAN STATISTICAL ASSOCIATION, ST. LOUIS, DECEMBER 28–30, 1910.

The seventy-second annual meeting of the American Statistical Association was held in St. Louis, Mo., December 28–30, 1910. Several other associations held their annual meetings at the same time and place. The following program was carried out with some slight changes:

PROGRAM.

WEDNESDAY, *December* 28, 8 p. m. Southern Hotel.

Joint meeting of the American Sociological Society, American Statistical Association, and American Association for Labor Legislation.

Presidential addresses:

(1) Henry W. Farnam, Yale University, President American Association for Labor Legislation. "Practical Methods in Labor Legislation."

(2) Franklin H. Giddings, Columbia University, President American Sociological Society. "The Relation of Social Theory to Public Policy."

(3) Frederick L. Hoffman, Prudential Insurance Company of America, Vice-President American Statistical Association. "Fifty Years of Life Insurance Progress."

THURSDAY, *December* 29, 10 a. m. Planters Hotel.

Special session on Agricultural Statistics.

(1) Paper: "The Degree of Accuracy and Margin of Error of the Census of Agriculture." Le Grand Powers, Chief Statistician, Division of Agriculture, Bureau of the Census.

(2) Paper: "The Census of Agriculture as a Source Book of Information for Students of Agricultural Economics." Henry C. Taylor, Professor of Agricultural Economics, University of Wisconsin.

(3) Paper: "Significance of Rapid Rise in Land Values, Increase in Number of Tenants and Managers, and Decrease in Number of Land Owners in Iowa 1900–1910." Benjamin H. Hibbard, Professor of Agricultural Economics, Iowa State College.

(4) Discussion: Changes in Agricultural Conditions Shown by the Census of 1910, led by John Lee Coulter, Expert Special Agent, Census of Agriculture; J. C. Thompson, University of Illinois; E. V. Robinson, University of Minnesota; and T. N. Carver, Harvard University.

THURSDAY, *December* 29, 2.30 p. m. Southern Hotel.

Joint session of the American Political Science Association and the American Statistical Association.

Topic: Primary Elections.

(1) "Primary Elections in Illinois." Hon. W. Clyde Jones of the Illinois Senate.

(2) "Direct Primaries in Missouri." Isidor Loeb of the University of Missouri.

(3) "Primary Elections in Iowa." F. E. Horack of the University of Iowa.

(4) "The Direct Primary Movement in New York." C. A. Beard of Columbia University.

(5) "Primary Elections and Their Results in Massachusetts, 1640-1691." Dr. Edward M. Hartwell of Boston, Mass.

FRIDAY, *December* 30, 10 a. m. Planters Hotel.

(1) "An Effort to Compare the Decreasing Fecundity in France and the United States during the Nineteenth Century." Walter F. Willcox of Cornell University.

(2) "The Method of Apportioning Representatives. A Problem in Statistics." Walter F. Willcox of Cornell University.

11 a. m. Business meeting.

Minutes.

The meeting was called to order at 11 a. m. by Vice-President Frederick L. Hoffman.

The reports of officers were then called for.

Secretary's Report.

Mr. President and Members of the Association:

I have the following to report in regard to the present condition of the Association and the work accomplished during the past year:

Membership, Dec. 31, 1909, date of last annual meeting		512
New members added		97
Deaths during the year	8	
Resignations	11	
Total deductions		19
Present membership		590
Net gain		78

Beside members we have:

Subscribers (mostly libraries)	156
Domestic Exchanges	38
Foreign Exchanges	114
Total mailing list	898

The net increase of 78 members is not so large as that of the previous year. This is simply an indication of the fact that your secretary has been so driven with other duties that he could not give as much time to the work as he had previously done.

The following members have died during the year: Julius Bien, William F. Draper, Charles B. Dudley, James F. Hunnewell, Robert Treat Paine, Peter A. Schemm, Francis B. Thurber, and James L. Whitney.

Four numbers of the Quarterly Publications have been issued during the year. It has been impossible to get these numbers out promptly on time, but the delay will be lessened as our new printer becomes more accustomed to the work.

Only one quarterly meeting has been held since the last annual meeting. This took the form of a dinner at the Ebbitt House, Washington, D. C., October 21, 1910. Fifty-two members and guests were present. The following papers were read and discussed: (1) Scope and Methods of Presentation of the Results of the Thirteenth Census, by William F. Willoughby; (2) A Method of Statistical Analysis, by Oscar T. Crosby.

The Washington members of the Association expressed the desire for a resident assistant secretary who could take charge of the arrangements for at least one quarterly meeting a year in that city. This was the practice of the Association some years ago, and it would seem desirable to make this arrangement if possible. I would suggest that such an officer be elected and that the necessary change in the constitution be made to render this a regular office.

In closing, I desire to thank the members of the Association for their continued coöperation and support in carrying on the work of my office.

Respectfully submitted,

CARROLL W. DOTEN,
Secretary.

On motion it was voted to accept the report of the secretary and to make it a part of the published proceedings of the meeting.

TREASURER'S REPORT.

RECEIPTS.

Membership Dues	$1,009.25	
Sales and Subscriptions	525.12	
Dividends and Interest	155.90	
Balance on hand Jan. 1, 1909	580.62	
		$2,270.89

EXPENDITURES.

Printing	$1,467.71	
Postage	110.55	
Salaries and Clerical Service	284.17	
Expenses*	24.58	
	$1,887.01	
Balance on hand	383.88	
		$2,270.89

ASSETS.

17 shares B. & A. R. R. Stock @ 224 ..... $3,808.00

S. B. PEARMAIN,
Treasurer.

Edward M. Hartwell reported for the auditing committee that the books of the treasurer had been carefully examined and that, with the exception of an excess of one cent in cash on hand, they were correct in every respect.

On motion the treasurer's report was accepted and placed on file.

The nominating committee, consisting of Edward M. Hartwell, Walter F. Willcox, and John L. Coulter, reported the following list of officers for the ensuing year: President, Frederick L. Hoffman; vice-presidents, Walter F. Willcox Henry W. Farnam, E. Dana Durand; Charles P. Neill, Edward M. Hartwell; treasurer, S. B. Pearmain; secretary, Carroll W. Doten; librarian, Horace G. Wadlin; counsellors, Cressy L. Wilbur, William H. Allen, William B. Bailey; editorial

*This item includes express charges, collection charges made by bank, etc.

board, John Koren, Thomas S. Adams, John L. Coulter, Frederick S. Crum, Allyn A. Young; committee on finance, Edwin W. DeLeon, Miles M. Dawson, S. B. Pearmain; committee on library, Charles F. Gettemy, Roger W. Babson, F. Spencer Baldwin.

It was moved and seconded that the secretary be instructed to cast one ballot for the entire list of nominees. This motion was unanimously adopted and the officers were declared elected.

On motion it was voted to empower the president and secretary to appoint an assistant secretary residing at Washington, D. C., to aid in arranging for meetings in that city.

On motion it was voted to accept the invitation of the National Civic Federation to send delegates to its eleventh annual meeting in New York City January 12–14, 1911, and the following delegates were chosen: Frederick L. Hoffman, Edward B. Phelps, William H. Allen, Franklin H. Giddings, W. S. Gifford, and Stanley L. Otis.

Committee on constitution and by-laws reported no changes.

The report was accepted and the committee discharged.

Walter F. Willcox made a report of progress for the joint committee of this Association and the American Public Health Association appointed at the last annual meeting to coöperate with Dr. Cressy L. Wilbur, Chief Statistician of the Division of Vital Statistics, U. S. Bureau of the Census, in the preparation of Uniform Standard Tables relating to births, deaths, etc. On motion the report was accepted and the committee was continued. The members of this committee are: Walter F. Willcox, T. S. Adams, Frederick S. Crum, C.-E. A. Winslow, and Allyn A. Young.

The following regular committees were then appointed:

Auditing committee: Roger W. Babson and Edward M. Hartwell.

Committee on time, place, and program of the next annual meeting: Frederick L. Hoffman, Henry J. Harris, and Carroll W. Doten.

Committee on constitution and by-laws: Walter F. Willcox, E. Dana Durand, and Cressy L. Wilbur.

The meeting was adjourned at 12.30 p. m.

CARROLL W. DOTEN,
Secretary.

DEGREE OF ACCURACY IN CENSUS STATISTICS OF AGRICULTURE*.

By L. G. Powers, *Chief Statistician, Division of Agriculture, Bureau of the Census.*

In making a brief address upon the subject of the degree of accuracy, or margin of error, in the Census statistics of agriculture, permit me to call your attention at the outset to the unique character of those statistics. They are the only ones compiled by the Bureau of the Census that have an intimate relation with the prices of commodities in the markets of the world. They are also the statistics to which the students of social conditions look for their final answer to many questions that are now agitating the public.

The prices of agricultural commodities are in great measure determined by their quantity, but the suspicion has arisen in the minds of the American people that the prices of many of the necessaries of life are not moving up and down in accordance with the general law of supply and demand, but have been determined in large measure by the action of trusts and other combinations in restraint of the freedom of trade. The people of this country, and especially the students of agricultural and social conditions, are looking for the publication of the Census figures of agriculture as the only trustworthy data for reaching any definite conclusion as to the soundness or baselessness of this suspicion. They look to the Census statistics of agriculture to determine whether any class of agricultural commodities have decreased in their production relatively to population and market demand to such a degree as to give rise to the enhanced prices of the day which so increase the cost of living of the average city dweller. The commission man, mechanic, and the humble toiler thus have a supreme interest in these statistics, and for

*Address delivered at special session on Agricultural Statistics, annual meeting of the American Statistical Association, St. Louis, Mo., December 29, 1910.

that reason it is imperative that those using them should have some knowledge concerning their degree of accuracy or the margin of error which accompanies them. A knowledge of this accuracy or margin of error is thus of vital interest to every person in this country, and this knowledge is more important with reference to the Thirteenth Census of agriculture than any Census that has preceded it. For this reason those connected with the Thirteenth Census have from the outset been giving great consideration to the subject, and in the final volumes of the Census much data will be published to assist the average student in forming his own opinion concerning the same.

Permit me at this time to call your attention to some of the measures of accuracy that are available, and the results of applying those measures to the Census reports. I will confine my remarks in this field principally to the data for the state of Iowa, which have been tabulated to a greater degree than that for any other state.

The farm land included in the census of agriculture in such a state as Iowa is very largely assessed for taxation purposes as "acre property," and there is but little land assessed as "acre property" that is not also used more or less for agricultural purposes. The margin of variation between the land assessed as acre property and that which is properly classed as farm land under the definition of the Census is for Iowa ascertained approximately. It is not more than one fourth of one per cent., and may not exceed one eighth of one per cent. of the total land area assessed as acre property. At the present time, the area assessed as acre property in Iowa is approximately 34,651,000 acres, while the area returned by the Thirteenth Census aggregates 33,930,137 acres. The Census acreage is approximately 720,000 acres, or 2.1 per cent., short of the total area assessed as acre property. If the amount of land assessed as acre property but never used for agricultural purposes constitutes, as stated above, the maximum of one fourth of one per cent. of the total of such land, then the Census report falls short of a complete return of all agricultural land 1.9 per cent.; while the percentage of shortage is 2.0, providing the aggregate of land assessed

as acres and never used for agricultural purposes constitutes only one eighth of one per cent. of the whole.

Under no circumstances, therefore, can the margin of omission of farm land by the Census exceed 2.0 per cent. of the total. Its degree of accuracy, therefore, approximates at least 98.0 per cent. of what is called for by theoretical perfection. As a matter of fact, the practical results attained by the Census should be given a greater percentage than the one here stated, and for the following reason: The Census seeks only to secure reports from lands that were actually used either in 1909 or 1910 for agricultural purposes. The enumerators were directed to omit from their reports all lands that were sometimes used for agricultural purposes, but were not so used in 1909 or 1910. This instruction was made to place the Census returns of agriculture on a basis practically identical with that of the census of manufactures, from which all reports of plants idle for a whole year were excluded. In the state of Iowa in the latter part of the decade just closed, there were in many counties long periods of heavy rain which rendered it impossible for the owners to make any use of undrained farms in 1909 or 1910. All the information thus far secured with reference to the amount of the agricultural land unused in 1909 and 1910 by reason of this and other causes indicates that it constituted at least one third and possibly one half of the assessed acreage that was not included in the Census report. If allowance is made for this known factor, the amount of agricultural land in use in 1909 or 1910 that was not included in the Census enumeration could not have exceeded 1.3 per cent. and probably did not exceed 1.0 per cent. of the total area of such land.

Here, then, we have a closer approximation to the relative perfection of the Census report of farm acreage, and are brought face to face with the fact that the margin of error in the Census enumeration of the area of farm land, after allowing for all duplications and omissions, was not to exceed 1.3 per cent. of the whole, and probably was materially less. This is a statement of the aggregate results obtained by the enumeration of over 200,000 farms, which constituted approximately one thirtieth of the farm area of the United States.

It is without doubt not far from the margin of error that accompanies the Census enumeration in the greater number of the old settled agricultural states of the north. That margin of error increases with the decrease in the density of settlement and the complexity of agricultural conditions. Considering the volume of statistics covered and the field included, it is doubtful if any other branch of Census statistics can be found where the margin of possible error is as small as this of the farm area of Iowa and of the old settled agricultural states, and in no other branch can the actual margin of error be computed with such exactness as is here done for the acres of land in farms.

In a few states, the records of the state auditor, or other official compiling statistics of the number of domestic animals subject to taxation provide data for similar measures of the degree of accuracy of the Census enumeration of domestic animals kept on farms and not on farms. These states are those which have made no material change in the last ten years in their methods of assessing domestic animals. The method of using these figures of the state auditors as measures of the general accuracy of the Census report is necessarily more complex than the one here set forth for testing the general accuracy of the Census report of farm acreage. This greater complexity arises from two factors: first, the Census classification of animals is not the same in 1910 as that employed in 1900; and, further, both classifications differ somewhat from the classifications employed for taxation purposes. But after allowing for these differences, the records of the state auditor for such a state as Iowa lead to the conclusion that the degree of accuracy of the number of domestic animals on hand April 15, 1910, is not greatly variant from that attending the Census enumeration of farm acreage.

As we pass from the enumeration of property as of April 15, 1910, (the date of enumeration) to the Census reports of farming operations and transactions of 1909, we are met at the outset with a greater margin of error. This error, like the error relating to farm land and domestic animals, is more largely an error of omission than one of duplication. There are undoubtedly duplications of farm area as between owners

and tenants, and similar duplications of the number of various classes of domestic animals; but these duplications are more than offset by omissions; and hence, the net result is the shortage of reports given, of which mention has been made above. There are duplications of crops and reports of other farm products and transactions of 1909, but these are more fully offset by omissions than in the other cases mentioned.

The principal cause of this greater margin of error expressive principally of omissions of crops and other products and expenses of 1909 than of acres and property of April 15, 1910, arises principally from the fact that a large number of farms changed their operators between the close of the crop year 1909 and the date of enumeration in 1910. The farm operator can give a more correct statement of the property under his control or ownership on the date of enumeration than he can of the crops on that property for the preceding year when it was under the control of another man. He can give a fairly correct statement of his own transactions if he operated the farm the year before, but he has to employ estimates or utilize hearsay information in reporting the crops, other products, and expenses of his farm the preceding year if he did not operate it at that time. This factor of error is further heightened by the fact that many farm operators who have been on their farms but a few months will not make any estimate of the crops, etc., of 1909, and the careless enumerator will secure no information relating to the same. As a result, about 2 per cent. of the Census schedules of 1910 have no reports of crops and other products and expenses of 1909. This omission makes it certain that all the statistics of crops, other products, and expenses of 1909 have a margin of omission of at least 2 per cent.

A careful examination of the schedules of a great many farm operators who were not on the farm in 1909 which they were operating in 1910, leads to the conclusion that when these operators make report of crops and other products and expenses of 1909, they give fairly correct statements of only the principal farm crops, such as the staple crops of their section. They give but very few reports of the minor crops, and their returns of the animal products, as well as purchases

of live stock, and farm expenses (especially those for labor, feed, and fertilizer) are quite imperfect; hence it is certain that the margin of error due to omission of all crops, products, and expenses (other than the staple crops) is much greater than 2 per cent.

Those in charge of the statistics of agriculture for the Bureau of the Census will make an earnest effort to present to the public using their statistics data on which those users may form a fairly trustworthy judgment concerning the margin of error, and thus the degree of accuracy that has been attained in all the classes of agricultural statistics compiled by the Census. In this way it is hoped and confidently believed that those statistics will be made of greater actual service to their users than any similar statistics of previous decades.

THE CENSUS AS A SOURCE BOOK IN AGRICULTURAL ECONOMICS.*

By H. C. Taylor, *Professor of Agricultural Economics, University of Wisconsin.*

Agricultural economics has for its field those economic forces with which the farmer has to deal. Wherever the Agricultural Census throws light upon the operation of these forces, it will be found useful to the agricultural economist. The statistics contained in the Census volumes of a given year show the status of agriculture at a given time. The Census volumes contain the only comprehensive source of material from which it is possible to ascertain the type of farming in every section of the United States. This gives the basis for the study of comparative agriculture, which is one of the best methods of gaining knowledge of the economic forces which determine the actions of farmers.

For example, the Census shows southeastern Wisconsin to be a dairy region and central Iowa a region where fat cattle and hogs constitute the principal source of income. These facts lead to a series of questions as to the reason. The facts with regard to the perishability and specific value of the products, their location with respect to the market, and with regard to the physical and social conditions which determine the relative competing power of each line of production in each region can be associated with the Census data in such a manner as to form a safe basis of inference regarding the character of economic forces in operation.

Not only the type of farming, but also the economic status of the farmer is shown in the Census for every county in the United States. The farmers of each of the two distinct races are divided into seven classes, based upon the relation they sustain to the land they cultivate.

The Census data give not only a basis for comparative study at a given time, but give also the data on which to base historical studies of the changes which are taking place in the type of farming and in the status of the farmer.

* Address at special session on Agricultural Statistics, annual meeting of the American Statistical Association, St. Louis, Mo., December 29, 1910.

The first Agricultural Census was taken in 1840. This first Census of Agriculture was a crop and livestock census. In 1850 general farm data were added and other improvements have been added each decade since.

In 1880 tenure statistics were added. Thus the basis for studying changes in the type of farming extends over a period of seventy years and the data for studying changes in the status of the farmer are available (with 1910) for four points in the curve. Too little use has been made of these valuable materials in the past.

Two methods which the writer has found useful in the utilization of these statistics may be mentioned:

A system of mapping which will provide a chart with close gradation of variation in density for each fact presented in the Census puts the material in form for ready comparison, both historical and geographical. Not only does the series of maps show the changes in the localization of each line of production through a series of years, and how the territory is divided between the various lines of production at a given time, but also the way in which the different lines of production are combined, or the type of farming in each district.

The tabular method can also be used to advantage in comparing types of farming. A table showing the proportion of the improved land in farms devoted to each crop shows the utilization of the land. The character of the crops, and the relation between the numbers of livestock kept and the amount of feedable products produced give a clue to the way in which the products are utilized,—whether sold in their original form as a product of the field, or used as a basis of the livestock industry. While a series of maps based upon quantities of product can be made to cover the seventy years, the statistics forming the basis of the tables showing the utilization of the land were first published in 1880.

In making use of the Census materials, the original statistics by counties are of first importance. The text which is intended to supplement the statistics while useful, and perhaps of greater immediate interest to the general public, is of less permanent importance than the detailed statistics.

FARM TENANCY IN IOWA.*

By Benjamin H. Hibbard, *Professor of Agricultural Economics, Iowa State College.*

Information on the subject of tenancy in any general way begins with the Census of 1880, at which time the figure for Iowa stood at twenty-four per cent. By 1890 it had grown to twenty-eight per cent; by 1900, to thirty-five per cent; and in the last census year, 1910, had reached thirty-eight per cent. Thus, from just below a quarter of all farms in the hands of tenants thirty years ago, there are at present almost two out of every five.

Contrary to the preconceived notions of many, Iowa is by no means uniform from one end to the other. There are a few well-defined areas in which differing soils, crops, and types of farming prevail, and tenancy varies with these varying types.

In the northeastern part of the state dairying predominates. The farms are a few acres smaller in size than the average for the state. The value of land per acre is here fourteen dollars (about one seventh) below the average for the state, though in one or two of these counties it is above the average, showing that dairying is not necessarily confined to the lower grade land. As a matter of fact it can be carried on successfully on the highest priced land of the state and has in a few record cases yielded over eighty dollars per acre gross income. In these dairy counties there are two peculiarities noticeable: first, the tenancy is low, being for twelve counties nine per cent. lower than the average; second, cash rent is much more prevalent than share, there being about nineteen per cent. of the farms rented for cash and but nine per cent. for a share of the product. The explanation of this would lie undoubtedly in the fact that on a dairy farm it is difficult to keep the shares separate—pasture, hay, and fodder in general not lending themselves to the process of easy division and separate sale. Tenancy is low in this

*This paper, read at *Special Session on Agricultural Statistics*, annual meeting of the American Statistical Association, St. Louis, Mo., December 29, 1910, is based on the Census reports and such information as the writer has of the state.

section for at least two reasons: the land has not risen to a very high figure, and dairying pays.

The southwestern part of the state is a cattle-feeding section. The cattle feeder scorns the exacting details of dairying. He knows dairying pays, but he doesn't like the business. Taking ten counties in this section, we find as before cash rent far in the lead of share; but unlike the dairy district, the total percentage of rented land is high, being six per cent. above the general average. The price of land in these counties is fourteen dollars an acre higher than the average for the whole state, while the farms are eight acres larger than the general average. Cattle feeding is an attractive business; but it frequently results in putting a successful man on a large farm and surrounding him with a number of tenant farmers from whom he buys corn.

With an altogether different basis of classification, ten of the oldest counties in Iowa may be taken along the eastern and southern border, in which the quality of land is not the best. Farming has not paid as well as in some other parts of Iowa. Here tenancy is low, corresponding almost exactly to the percentage of the dairy district, except that the cash tenancy is but three points ahead of the share, instead of more than twice as great. The price of land is thirty dollars below the average.

In the northwest corner, where land is comparatively new, low in price, and is held still to a considerable extent by non-resident speculators, tenancy is high. In fact, it is higher here than in any other logical grouping of counties that suggests itself, reaching for ten counties forty-seven per cent. Share tenancy, for the first time in the combinations found, is greater than cash, twenty-two and one half per cent. of the farms being rented on shares, and nineteen and one half per cent. for cash. This is the most poorly drained of any part of the state, and crops are, on this account, subject to much damage by excessive rains, such as have prevailed during most of the ten years just past. The tenants are unwilling to take all the risks and frequently refuse to pay cash. Moreover, this is a grain-growing region, and the mechanical difficulties of the share plan are as small as possible.

One further attempt may be made at classification, taking as the basis the price of land without regard to the type of farming. It appears that tenancy is decidedly high on high-priced land. In the ten counties of highest values the average price per acre is one hundred and twenty-seven dollars, and tenancy stands at four per cent. above the state average. In the ten counties with the lowest-priced land, the price averaging sixty-three dollars, the percentage of tenancy is twenty-five,—only two thirds as high as for the state.

The facts at hand suggest strongly that so far as Iowa is concerned at present, the leading factor in the increase of tenancy is speculation. A great number of men are investing in land, not for the sake of the rent which it will bring, but in the hope of an increase in the selling value. The land is in demand and is let out to tenants for what it will bring, usually well under the figure demanded by investors who depend on the annual income. Thus far these speculations have paid well, and as long as the price of land continues on the up grade, the attendant tenancy conditions may be expected to remain as they are. Speculation is still prevalent throughout the state, though particularly so in the groups of newer counties.

The second factor back of the tenancy movement appears to be the type of farming pursued; since in the cases where other influences are constant, the tenancy varies widely from one type of operations to another.

The third and most constant factor, though not the most effective in all cases, is the value of the land. This fact is unmistakable: other things being equal, tenancy increases directly with the price. But other things are not always equal; hence, the prevailing notion that price is necessarily the controlling force would seem by this study to require important modification. Taking Iowa, county by county, and comparing price of land to tenancy, the figures become very much confused, which would seem sufficient proof that other forces are present.

It is not the writer's belief that the three factors just reviewed are the only ones needed in explaining tenancy in Iowa. No doubt there are many factors of a local, even per-

sonal nature that must be studied before the whole current of the movement can be understood.

Iowa is counted a good farming state, and Iowa farmers are held up as a type of prosperity; yet all told, the land is slipping out of their hands. This unfortunate fact is explained partly in terms of the farmers; many of them were equal to the occasion when farming was a simple business, but for some reason cannot adapt themselves to the more complex business of the present. They stick to their old methods and their accustomed crops. For them the price of land is too high; they can do better on cheaper land; but if they remain in Iowa they must rent, though they will not prosper. For another type of farmer (and they are numerous), the difficulty is not so much inability to handle the land skillfully, as lack of capital for the initial investment. To buy an average sized farm in Iowa at the average price requires sixteen thousand dollars, and a beginner can hardly hope to borrow half of that amount; hence he must have eight thousand besides another thousand or two for equipment and he does not have it; therefore he must remain a tenant, for a considerable number of years. Supplementing these changes, the past ten years have brought prosperity to the merchants and bankers of Iowa, and they have bought farms in the vicinity of every hamlet. They do not want to sell but prefer to accommodate the tenant with the farm on which to operate.

Tenancy may not be bad, but it is less desirable than land ownership by the tiller of the soil. A clear understanding of the case by the farmer himself, and a better system of farm credit would at least postpone the day when the tenants outnumber the land-owning farmer.

CHANGES IN LAND VALUES, NUMBER OF FARMS, AND NUMBER OF TENANTS AND OWNERS SINCE 1900.*

By John Lee Coulter, *Expert Special Agent, Division of Agriculture, Bureau of the Census.*

Enough of the results of the Thirteenth Census of the United States has been given to the public concerning the present status of agriculture to warrant the first attempt at some general statements of movements or tendencies since 1900. In this brief paper I shall limit myself to the general farm information, and not refer to the data pertaining to crops or livestock.

The first item on which we have definite information is the total number of farms. A complete statement for a group of three states (Iowa, Illinois, and Indiana) shows a decrease in ten years of approximately 32,740 farms, or nearly 5 per cent. of the total number of farms in these states. This represents the movement in the large group of states in the upper Mississsippi Valley; it is consistent in county after county, and is not confined to these three states. Indeed, if we divided the states of Minnesota, Wisconsin, and Michigan, north of the three first mentioned, into two divisions by an east and west line, we could add the southern third of each of these states to the list already given. The same decrease in number of farms is noticeable. But there are many thousands of acres of undeveloped land in the northern part of these last-mentioned three adjoining states, and during the last decade settlement has continued in this new district, and hundreds of new farms are being established. This movement is so strong that the increases in the newer sections of these states completely conceal the decreases in the older sections. The total increase in number of farms for these states is 10,970.

Turning now to the reports for the New England states, we find that the number of farms reported for Maine, New

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Hampshire, Vermont, Rhode Island, and Connecticut (Massachusetts has not yet been reported) in 1900 was 154,170, while it is now reported (1910) as 150,900. This is a decrease of 3,270, or something more than 2 per cent. As in the case of the six states in the preceding groups, each of these states shows a decline except Maine. There is a slight increase in the northern part of that state (474 farms, or 0.8 per cent.). The same decreases are found in Pennsylvania and New Jersey; the former has decreased in number of farms 2.6 per cent., and the latter 4.3 per cent. Little has yet been published concerning the states where large increases are anticipated.

VALUE OF LAND.

A brief survey of the value of "land and buildings" and "land alone" in these states is equally interesting. Iowa shows the greatest gain,—117 per cent. Illinois follows with 99 per cent., and Indiana with 89 per cent. The same order maintains if we consider the change in value of land alone. In 1900 the land in farms of these three states (exclusive of buildings) was reported by their operators to be worth $3,458-499,000. In 1910 the operators of the same land (there were 32,740 fewer farms, and the average farm was nearly six acres larger in each state) reported the land to be worth $7,202,422,000—an increase of considerably more than 100 per cent. The other three states in that group—Minnesota, Wisconsin, and Michigan—also show large increases in values reported. That for Minnesota land and buildings is 88 per cent.; Wisconsin, 75 per cent.; and Michigan, 54 per cent. Land alone in these states increased more than $1,025,000,000. The total increase for these six states was $4,769,002,000.

Turning to the New England States, we find the same upward movement along with the decrease in the number of farms. Land and buildings in Rhode Island increased 19 per cent.; in New Hampshire, 22 per cent.; in Vermont, 35 per cent.; in Connecticut, 40 per cent.; and in Maine, 64 per cent. The total increase in value of land alone was from $196,535,000 to $274,869,000, or nearly 40 per cent. This is less than half the rate of increase reported by the North Central States.

OWNERSHIP OF LAND.

One of the most significant features of the reports now appearing pertains to the ownership of the land. The increase in the number of tenants had been so rapid between 1880 and 1900 that many predictions have been made relating to the changes during the last ten years. Each of the six states in the North Central group shows more tenants than in 1900. The following brief table shows the change:

State.	Number of Tenants 1910.	Per Cent. of all Farmers.	Number of Tenants 1900.	Per Cent. of all Farmers.	Increase in Number.	Value per Acre of Land, 1910.
Illinois	103,999	41	103,698	39	301	$95
Iowa	81,837	38	79,736	35	2,101	83
Indiana	64,451	30	63,448	29	1,003	62
Minnesota	32,748	21	26,755	17	5,993	37
Michigan	32,635	16	32,213	16	422	32
Wisconsin	24,554	14	22,996	14	1,558	43
	340,224		328,846		11,378	

It is worthy of note that the largest percentage of tenants is found in Illinois, both in 1900 and 1910. In the same state is found the highest value per acre of land. The next highest percentage of tenancy, both in 1900 and 1910, is found in Iowa, accompanied by the next highest average value of land per acre. Indiana comes next in order in all respects.

It is also noteworthy that in these three states the decline in number of owners in ten years amounted to 14,039 in Illinois, 14,715 in Iowa, and 8,226 in Indiana, a total of 36,980, or 8 per cent., the total owned farms in these states in 1900 being 462,035.

Minnesota, Wisconsin, and Michigan, with land valued at approximately half as much per acre, show approximately half as large a percentage of tenancy as Illinois, Iowa, and Indiana.

This close parallelism between number of tenants and value of land is very interesting, and a more detailed study of the problem is desirable. Before passing, it should be noted that any special study must also take into consideration: (*a*) the newness or oldness of the district; (*b*) the character of the industry; (*c*) the nationality of the farmers; (*d*) the original

land system and size of farms, etc. Thus, the presence of great numbers of Germans, Scandinavians, Swiss, Polanders, and other special classes of people in Minnesota and Wisconsin may be as significant as the lower land values or the newness of the country. Again, a study of the special situation in the tobacco and dairy districts of Wisconsin as compared with the wheat farming of Minnesota is essential to a complete statement. We must also remember in any explanation of the considerable increase in the number of tenants in Minnesota, that that was the state of bonanza farms, and that these are being broken down.

So many statements have appeared concerning the number of managers that it will be well to note in passing that in 1900 there were 10,473 managers of farms reported from these North Central states, while in 1910 the number had increased to 11,209, or 736 managers. Eleven thousand two hundred and nine managers out of 1,220,000 farmers is at best a very small item—less than one per cent. The change is almost negligible.

Turning now to the New England States, a wholly different situation presents itself. The following table should be of interest:

State.	Number of Tenants 1910.	Per Cent. of all Farmers.	Number of Tenants 1900.	Per Cent. of all Farmers.	Decrease in Number.	Value of Land per Acre, 1910.
Maine.....	2,536	4	2,775	5	239	$14
New Hampshire..	1,864	7	2,185	7	321	14
Vermont.....	3,990	12	4,820	15	830	13
Connecticut.....	2,565	10	3,467	13	902	33
Rhode Island....	936	18	1,108	20	172	34
	11,891		14,355		2,464	

The most important feature is that each state shows a definite falling off in the number of tenants. The total decrease is 2,464, or 17 per cent. of all. It will be remembered that these states (except Maine) showed a decrease in the total number of farms of only 2 per cent. This decrease in the number of tenants is therefore remarkable, especially in the light of the predictions which have been made by some.

CHANGES IN AGRICULTURAL CONDITIONS SHOWN BY THE CENSUS OF 1910.*

By J. G. Thompson, *Professor of Agriculture, University of Illinois.*

I am under obligation to the preceding speakers for their comments on the changes in agriculture during the last decade as indicated by these summaries. Inasmuch as a copy of the summaries came into my hands only about twelve hours ago, I have been able to give comparatively brief attention to them.

I would say in regard to the summaries that the information given is scarcely detailed enough to make possible its proper interpretation. The farms are not distributed according to the chief source of income, either in general or according to size groups. Further, we cannot discriminate between the different parts of a state, which may be given up to different kinds of farming, since our data are simply for the state as a whole. To illustrate, in Illinois we have the northern or dairy section, the central or corn belt, and the southern or wheat belt. Now we cannot tell in what proportion such changes as have occurred in Illinois relate to one or another or to all three of these sections. Again, in dealing with the values indicated in these summaries we should remember that these values have not been corrected to correspond with any change in the value of money that may have occurred within the decade.

Dr. Coulter has already brought out the significance of many of the changes of a general character so that it is unnecessary to dwell upon these points at length. Some of the more striking of these I shall refer to, with particular reference to the state of Illinois.

1. In regard to the changes in the distribution of farms according to size groups, there has been a general increase in the number of farms of 19 acres and under (except in Illinois, where a slight decline is shown) and almost as general a de-

*Discussion at special session on Agricultural Statistics, annual meeting of the American Statistical Association, St. Louis, Mo., December 29, 1910.

crease in the number of farms in the size groups 20–49 acres, and 50–99 acres. There has been a similar decrease in the number of farms in the size groups 500–999 acres, and 1,000 acres and over, in the North Central states, for which we have data—except in the case of Michigan and also in the case of Missouri and Minnesota for the former group. In general, the opposite conditions prevail in regard to the latter two size groups in the Eastern States for which we have data. All of the North Central States show an increase in the number of farms, in the two size groups 100–174 acres and 175–499 acres, especially the latter, except Illinois and Minnesota which show small decreases in the former (in Iowa the increase in size group 100–174 acres is negligible). Almost without exception the Eastern States show a decrease in the number of farms in these two size groups.

The changes, then, in the western section of states seem to be, in the main, in the direction of the breaking up of the largest sized farms and of the disappearance of the moderately small farms, and the redistribution of the same into the smallest sized farms and into the size groups 100–174 acres and 175–499 acres.

We cannot tell whether this decrease in the number of farms in certain size groups means a change in the size of farms for particular purposes, or a decrease in the number of farms devoted to those particular purposes, or both. In Illinois the indications are for both, with a greater preponderance of grain farms and of live stock farms in group 175–499 acres as compared with group 100–174 acres, than existed in 1900. The concentration in the former of these two groups in Illinois probably connotes the relative increase in grain farming in that state during the last decade, since grain farms were generally larger in size, in Illinois, in 1900, than livestock farms—except in the case of very large farms,—and the decline in the number of these latter, of course, serves to strengthen the supposition of the substitution of grain farming for livestock farming in Illinois.

This general concentration in the size groups 100–174 acres, and 175–499 acres, in the grain growing section, probably represents the adjustment of the size of the farm to the

most economical use of machinery, inasmuch as farm implements and machinery for this purpose are increasing both in size and in variety.

It may be that Dr. Coulter's suggestion that the increase in the number of farms of 19 acres and under means, in general, an increase in vegetable farming; but it is to be noted that in 1900, in Illinois, there were more vegetable farms in the size group 20–49 acres than in any other single size group.

2. The moderate but general increase in the "average acres per farm" in the North Central group, and the quite as general, and in some cases striking, decrease in the same in New England and Middle Atlantic States attract our attention. In the grain section the tendency of the farm to adapt itself to the size most economical for the use of machinery is, as remarked above, apparent. Any tendency in this direction, however, would naturally be slow, since there are so many retarding factors in regard to change in the size of farms. In Illinois, although the average farm is now larger than at any previous time since 1860, it is still no larger than it would have been in 1900 had not that state proved an exception to the general tendency in the North Central section, during the decade 1890–1900, toward a larger acreage for the average farm.

3. A general decrease in the number of owners, coupled with (*a*) a general and surprisingly moderate increase in tenancy in the North Central States (a marked increase—22 per cent.—in Minnesota, and a considerable loss—5 per cent.— in Missouri), and a quite as general, and in some cases decidedly marked, decrease in tenancy in the Eastern States; and (*b*) a marked increase, in nearly all sections for which we have data, in the number of farms operated by hired managers, is shown.

Illinois is a striking illustration of this movement. During the last decade the actual number of farm tenants in the whole state of Illinois increased to the extent of only 301, or a proportional increase of three tenths of one per cent.; while farms operated by hired managers in Illinois number 440 more in 1910 than in 1900—a proportional increase of 22.6 per cent. To be sure, the proportion of tenants to "all

farms by tenure" has increased, in Illinois, within the last decade from 39.3 per cent. to 41.4 per cent.; but even this very moderate increase is due rather to the decline in the total number of "all farms by tenure" than to any real increase in the number of tenants.

This greatly increased tendency towards the operation of farms by hired managers indicates the comparative failure of our tenancy system. It indicates a growth of capitalism in agriculture—a movement away from the coöperation implied in tenancy—but a capitalism that, on account of the small increase in the average size of farms, is not at all alarming, and that is more apt to be beneficial than otherwise.

Without knowing whether such is actually the case, I suggest that this general and striking increase in the number of farms operated by hired managers may be due to the fact that our agricultural colleges have been turning out, in recent years, increasing numbers of young men trained in scientific agriculture. Perhaps these young men are being more and more utilized as hired managers and are, to a less extent than previously, taking up farms as tenants.

I should like to call attention to the fact that the movement in regard to tenancy in Illinois during the last decade presents an exception to a principle heretofore generally recognized, and just now referred to by Professor Hibbard respecting tenancy in Iowa—namely that tenancy seems to be most prevalent in the most fertile sections and seems to be coincident with high values for land. Now Illinois is undoubtedly one of the most fertile states—if not the most fertile state—in the United States, and land values have increased over 100 per cent. in that state within the past ten years, while tenancy has been practically at a standstill in the state during the same period.

4. The increase in the value of land seems to be most emphasized in those states where we have reason to believe there is a tendency toward grain raising, while the increase in the value of farm buildings has apparently been largest in those states where we have reason to believe that grain farming has been on the decline. This is as might have been expected.

The caution given above, that values may need to be corrected on account of possible changes in the value of money, should be kept in mind at this point.

5. These summaries show a surprisingly moderate increase in the value of farm implements and machinery in the grain-growing states during the past decade as compared with the amount of money expended for farm labor. This is the more surprising when taken in connection with the supposedly increasing size and variety of farm implements and machines required on the most successful grain farms, and the increasing extent to which such farm machinery is supposed to be replacing farm labor. If it means that farm machinery has increased in price in the last decade less rapidly than prices for other articles or commodities, it may be taken as indicating that the monopolization of the farm machinery industry in the past few years has not resulted in higher prices for this class of products to the extent anticipated.

The relatively larger increase in the amount of money expended for farm labor may mean higher wages, or more farm laborers, or both.

6. In the face of an apparent increase in grain farming in Illinois and in the face of the asserted deterioration in soil fertility in that state, I have been at a loss to explain the considerable decline in the amount of money expended for fertilizer in the state during the past decade. Perhaps Dr. Coulter's explanation that farmers are, as a result of the agitation by farm journals, by the state agricultural colleges, and by the United States Department of Agriculture against the indiscriminate purchase of fertilizer, really buying with more discrimination, may be correct. It is quite possible, of course, that the expenditure for this purpose in Illinois may have been exceptionally small during the Census year.

CHANGES IN MINNESOTA AGRICULTURE INDICATED BY THE PRELIMINARY RESULTS OF THE THIRTEENTH CENSUS.*

By Edward Van Dyke Robinson, *Professor of Economics, University of Minnesota.*

Minnesota illustrates most of the general tendencies traceable in the North Central group. These are, however, modified to some extent by the large area of untilled land in the northern part of the state, which is gradually coming under the plow. This process produces a series of agricultural zones varying greatly as to type of agriculture and intensity of cultivation. These differences tend to obscure the factors at work in the more advances zones, and render averages for the state less satisfactory than for more homogeneous states such as Iowa or Illinois.

From 1900 to 1910, the total acreage included in farms has increased from 26,248,000 to 27,623,000 acres (1,375,000 acres, or 5 per cent.), while the improved acreage has increased from 18,443,000 to 19,609,000 acres (1,166,000 acres, or 6 per cent.). The proportion of improved acreage to total in farms has thus risen from 70 to 71 per cent.

On the whole, it must be confessed that these changes are conspicuous by their smallness. In view of the large area in Minnesota not yet included in farms, it is surprising that the acreage in farms has increased only 5 per cent. The explanation is doubtless that the unoccupied lands of Minnesota are mostly in the forested or cut-over districts, and farmers prefer prairie lands ready for the plow, like those in Western Canada. Another factor has been the unusual rainfall of the last five or six years in the Great Plains region, which has drawn a large immigration to the (normally) arid lands of the western Dakotas and western Montana. A further reason is the effective advertising of these prairie lands by the Canadian government and by numerous land companies.

*Paper presented at special session on Agricultural Statistics, annual meeting of the American Statistical Association, St. Louis, Mo., December 29, 1910.

The slight increase in percentage of improved lands included in farms indicates two things. In the first place, the districts recently taken up for farming purposes naturally show a low percentage of improved lands, and this tends to hold down the average. In the second place, and this is a point of some interest, it is evident that the pressure is now upon the intensive rather than the extensive margin of cultivation. The tendency is toward enlarging the output of the farms through more intensive farming of the better lands, and so long as that is successful the margin of cultivation will not so readily descend to the poorer lands.

The changes shown in the size of farms are very suggestive. The figures are as follows:

Classes of Farms	1910	1900	Increase or Decrease 1900–1910		Percentage Distribution (of total)	
			Number or Amount	Per cent. of Change	1910	1900
19 acres or less	5,501	4,803	698	15	4	3
20 to 49 acres	11,991	13,278	1,287	10	8	9
50 to 99 acres	26,511	30,990	4,479	14	17	20
100 to 174 acres	55,355	56,735	1,430	3	36	37
175 to 499 acres	52,751	45,473	7,288	16	33	29
500 to 999 acres	3,341	2,965	376	13	2	2
1000 acres and over	299	365	66	18	0.2	0.2

It is clear, from an examination of the per cent. column, that there has been a marked decline in the number of small general farms (between 20 and 175 acres), and also in the number of large farms (over 1,000 acres). On the other hand, there is a notable increase in the class of farms under 20 acres, devoted to market gardening and the like; and an even greater increase in the classes of general farms (between 175 and 1,000 acres), which has raised the average farm in Minnesota from 170 acres in 1900 to 177 acres in 1910. The conclusion is irresistible that there is in progress an adjustment of the size of farms to the types of farming.

Such an adjustment is a step toward more economical and effective farming; and this is equally true, whether it is attained by enlarging or diminishing the size of farm. It is a vicious popular error, propagated by Bolton Hall's "Three

Acres and Liberty" and similar sentimental works, to suppose that a smaller farm always means better farming. That depends absolutely upon the crops grown, the amount of handwork involved in their production, the progress of invention as to labor-saving machinery, the relative cost of labor and capital goods measured by their output, the value of the output per acre multiplied by the number of acres which can be handled by a unit-equipment of labor and capital, and the proportion in which management must be combined with the other factors to give maximum returns; in brief, it depends upon the type of farming. Thus the size of farm which is best for vegetable gardening would be absurd for wheat growing; yet we need bread no less than vegetables, and it is to the interest of all, consumer and producer alike, that wheat be grown by the most efficient combination of land, labor and capital. Again, an intertilled crop such as corn presents quite a different problem from the small grains; a hand-thinned crop such as sugar beets has another set of requirements; and the various branches of the animal industry, such as dairying, introduce still other problems which affect the proportion of land to labor and capital. There is, consequently, no one size of farm best suited to all types of farming; nor can the best size for any given type be ascertained except by experiment. Moreover, the best size today may not be the best tomorrow, since it varies with the invention of new machinery and with any other change which affects the relative cost of labor and capital goods. In the case of Minnesota, for example, the average farm, based on the homestead unit, has long been too small for the most economical operation in small grains, owing to the introduction of highly efficient machinery for such crops; and there is little doubt that the Babcock test, the mechanical separator, and the use of factory methods generally in the dairy industry have tended likewise to enlarge the dairy farm.

In view of these facts, it is unfortunate that the census does not make at least three divisions between 175 and 500 acres, and a corresponding number between 500 and 1,000 acres. This would permit a closer delimitation of the size of farms with reference to the principal types of farming. It would

likewise show which types tend to large and which to small farms, and thus enable us in a measure to forecast the future of American agriculture. This is surely a problem not only of economic interest and importance, but of great social and political significance as well; for American democracy in the past has been the product of the one-family farm.

In the matter of land tenure, there have also been some interesting developments, as shown by the following table:

Farms by Tenure	1910	1900	Increase 1900–1910		Percentage of total	
			Number	Per cent.	1910	1900
Worked by owners.....	121,802	126,809	5,007	4	78	82
Worked by tenants.....	32,748	26,755	5,993	22	21	17
Worked by managers.....	1,209	1,095	114	10	0.8	0.7

Farms operated by owners thus declined from 82 to 78 per cent., while farms operated by tenants and managers increased correspondingly. I understand, however, that these changes have chiefly taken place in the northwestern quarter of the state, where the number of farms of over 1,000 acres has fallen off considerably. Taken together, these facts undoubtedly mean that a number of the "bonanza" farms have been broken up and leased to tenants, who are presumably, in many cases, on the way to buy the lands they now occupy. The slight increase in farms operated by managers probably testifies to the influence of the colleges of agriculture, which are turning out young men well trained for such positions.

The expenditures for fertilizers have decreased 75 per cent. during the decade. It is evident that the farmers have learned other methods of conserving the fertility of the soil without the use of commercial fertilizers, which can be used profitably only in the production of special crops of high value per acre. On the other hand, the expenditures for labor have increased 33 per cent. This increased cost of labor is undoubtedly one of the influences tending to break down very large farms and to substitute smaller sized tenant farms. One reason for it is no doubt the decline of the lumber industry. For many years the men who worked in the lumber camps during the winter

migrated to the farm lands with the opening of spring. Since they were thus employed most of the year they could be had at relatively low wages. The time is now at hand when such migratory labor cannot be obtained, or if such men are employed, they must be paid wages sufficient to keep them for the entire year. Scarcity of migratory laborers is thus one of the causes tending to drive out extensive grain farming, and to substitute mixed farming whereby the men can be employed the entire year.

The value of tools and machinery increased 74 per cent. This increase exceeds that for labor, and suggests that more and more machinery is being used as a means of minimizing hand labor. At the same time, the increase in value of machinery is less than the increase in lands and buildings. This would seem to indicate that the machinery situation is in a fairly stable condition; in other words, that no revolution due to radically different types of machinery is now in progress.

The value of land and buildings rose 88 per cent. during the decade, the increase in land itself being 82 per cent. and in buildings 120 per cent. This large increase in buildings signifies, of course, a considerable investment of capital in fixed form, and is probably to be explained by the erection of good farm structures on the new lands in the northern part of the state. It may be that the increase in the dairy business has also had some effect.

The rise in the value of land presents a more complex problem. Land is, of course, worth in the long run, its net product capitalized at the current rate of interest. Its value will consequently be increased by either a fall in the rate or an increase in the net returns from the land. There is little evidence of a fall in the rate of interest during the last ten years; indeed, there are some indications of a rise during the last three or four years. The yield per acre has doubtless been somewhat enlarged by more intensive farming, especially by the northward migration of dairy farming and corn growing. However, land values have probably been affected to an even greater extent by the higher prices obtained for farm products during the last few years.

This advance in prices suggests that we have definitely entered upon a new era. Ever since the discovery of America, the Old World has been exposed to an increasing stream of influences and of products from the New World. This reaction of America upon Europe has reached a maximum of intensity since about 1860, owing to the perfection of harvesting machinery, the use of Bessemer steel for steamships, locomotives, and rails, and the rapid extension of railways into the plains west of the Mississippi. Never in the history of man has so great an area of fertile land been brought under the plow and made accessible to the world's markets in so brief a time. As a result, Europe has been inundated by a flood of farm products, forcing prices down to levels never before reached. In fact, prices have for considerable periods of time gone below the cost of production in a large part of the United States. This condition was an important cause of the Granger legislation and the insistent demand for "cheap money," represented by the greenback and free silver movements. In Europe the cheap food stuffs from America caused a profound crisis in agriculture. Some countries, such as Denmark, were forced virtually to abandon grain growing, while the area under grain was greatly diminished in most of Western Europe. This American competition, moreover, gave rise to the agrarian protection movement which has dominated the commercial policy of most European countries for the last thirty years.

On the other hand, the city populations both in America and in Europe have thriven and multiplied by reason of cheap food stuffs. This has been the fundamental fact underlying the rush from the country to the cities. Never before have so many people lived in the cities or lived so well as during the last half century. Economic doctrine, too, has been profoundly affected by the fact of cheap food stuffs. It has a close relation to the modern neglect of production in favor of theories pertaining to distribution. It, moreover, explains the prevalent optimism in economic thought, in contrast to the pessimism of the Ricardian School. For example, who would ever have formulated doctrines of pleasure economics, as opposed to pain economics, except on the basis of cheap food stuffs, and a consequent high standard of living?

So far, however, as our thinking has presupposed an indefinite continuance of cheap food stuffs, we have all been living in a fool's paradise. The Columbian age, the age of plenty produced by opening up and exploiting the colossal riches of a new continent, is drawing to a close. Of this fact, the rising value of farm lands in Minnesota, which reflects largely the higher prices obtained for farm products, is evidence. We shall never again see cheap food stuffs in the sense that we have had them in the past. The population of the world has of late increased much faster than the area brought under the plow; much faster than the intensity of cultivation on lands already cultivated; and much faster than the total crop of food stuffs. Moreover, no second Mississippi valley remains to be exploited. Most of Australia is arid and much of Canada and Siberia is frigid; and the lands that remain to be put under cultivation in Asia, in Canada, and in Argentina have not the economical potentialities of those that have been brought under tillage in the last fifty years.

During all this age of plenty, the farmer alone has been oppressed with poverty, since for him it has meant low prices for his products. These conditions have given rise to our current American conception of the farmer as a hardworking and underpaid member of society, at the mercy of all other classes. For the future, the farmer who owns a rich farm and knows how to manage it must be reckoned a capitalist, who is moreover certain to receive year by year an increasing share of the social dividend. However it may be in the cities, the high cost of living so far as it is due to higher prices for food stuffs, means prosperity on the farm.

LARGE-SCALE AND SMALL-SCALE FARMING.*

By T. N. Carver, *Professor of Economics, Harvard University.*

It seems to me that this is one of the most interesting and instructive meetings I have ever attended, and I am particularly glad to hear the fact brought out that an increase in the intensive farming may and does go on while farms are growing a little larger and the farming population a little scarcer. That is, the soil is being made to produce more through more thorough cultivation, not through the use of more labor, but by the use of more capital. That seems to be the significant thing that is happening in the state of Iowa and the agricultural regions of the surrounding states.

It seems to me that in view of the facts that have been brought out today we may be justified in redefining large-scale, medium-scale, and small-scale farming. It is obvious that acreage alone is not a basis for this classification. You may have large-scale farming on twenty acres, and you may have small-scale farming on two hundred acres. It seems to me that the definition and the classification should be based on the general character of the business unit known as the farm, with the labor supply as the principal ingredient. Large-scale farming would, therefore, be any kind of farming in which the manager did not do the manual work, but confined himself mainly to the work of superintendence. A twenty-acre market garden worked by a gang of laborers under a superintendent would thus be a large-scale farm. And a medium-scale farm might be called a one-family farm, that is, a farm run by the labor of one family, but a farm on which that labor was equipped with the best teams and the best machinery known to agriculture. That seems to be the type of farming which is developing more and more in the prosperous agricultural sections of the West. Then small-

*Remarks at special session on Agricultural Statistics, annual meeting of the American Statistical Association, St. Louis, Mo., December 29, 1910.

scale farming would be of a type which might otherwise be termed peasant farming; that is, where the labor is done by the farmer and his family, but where the acreage is too small to permit of good teams or good machinery. This is not the most productive type of farming, though it is the kind which is being advocated by a good many of our long-distance farmers. They are holding up to our admiration the French peasant. But the French peasant who has to make his living by general farming off a thirty-acre farm must of necessity use inferior methods of production. Such a farm will not support a good team of horses, sometimes not even a yoke of oxen. The farmer therefore finds it more economical to use his milch cow for a draft animal and do the rest of the work by hand. That is, he will have more left for himself by this process than he would if he tried to use a team of horses, for the horses would eat up so large a proportion of the total crop as to leave him less for his own family, even though the horses could do more work than the milch cow. This type of small-scale farming also seems to be disappearing, judging by the statistics which have been given us. It seems to me, therefore, that to the discriminating mind the statistics of population in this agricultural area are things to be thankful for rather than to be alarmed over.

THE CHANGE IN THE PROPORTION OF CHILDREN IN THE UNITED STATES AND IN THE BIRTH RATE IN FRANCE DURING THE NINETEENTH CENTURY.

By Walter F. Willcox.

The object of this paper is to determine approximately the changes in the birth rates of the United States during the nineteenth century and to compare those changes in direction and amount with the changes which went on in France during the same period.

In European countries as a class the steady and rapid decrease of the birth rate is a comparatively recent fact. If one considers the average birth rate for each ten years of the century or of so much of the century as is covered by the records, the maximum rate is found to have been reached in France as early as 1811–20, in Norway, Sweden, Finland, Austria and Prussia in 1821–30, in Belgium in 1831–40, in Denmark in 1851–60, in Scotland and Spain in 1861–70, in England and Wales, Ireland, Hungary, Switzerland, Germany, Bavaria, Saxony and the Netherlands in 1871–80, in Portugal, Italy, Servia and Roumania in 1881–90. In 16 of the 22 countries named the lowest birth rate was for the last decade of the century.*

The usual opinion of American students, I believe, is that the decline of the American birth rate, about which so much is written and so little known, is likewise a comparatively recent fact. In the valuable paper by Dr. J. S. Billings† the statistical argument was confined to the decade between 1880 and 1890, but the more general discussion with which he concluded shows at various points that he conceived the change to have set in thirty to forty years earlier, or about the middle of the nineteenth century. This conviction has furnished an important support to the argument that the decrease of the American birth rate, starting when foreign immigrants first

* Statistique Internationale du Mouvement de la Population, Paris, 1907, p. 141.

† "The Diminishing Birth Rate in the United States," Forum, June, 1893.

became a powerful influence and manifest where and only where those immigrants settled, was caused by immigration and resulted in little more than a replacement of the earlier by the later stocks.

The belief that the decrease of the American birth rate began not earlier than the middle of the nineteenth century finds support in some conclusions from the figures of the Twelfth Census. In the passage referred to below* I showed that the proportion of children under 5 years of age to each 1,000 women between 15 and 49 years of age during the last half of the century, for which alone the figures were to be had, changed as follows:

Date.	Living children under 5 years old to 1,000 women 15 to 49 years old.
1850	626
1860	634
1870	572
1880	559
1890	485
1900	474

This evidence clearly supported the prevailing opinion and led me to the belief that the decrease of the American birth rate began at about the time of the Civil War. I now think this inference was unwarranted and that the decrease began as early as 1810.

The preceding table can be carried back for earlier census years by means of estimates. But for that process it seems wiser to assume the years of child bearing as 16 to 44 instead of 15 to 49, because in 1800, 1810, and 1820 the white women 16 to 44 were reported by the census and estimates are needed only for the colored.

Estimated number of women 16 to 44 years of age.

1900, 1890 and 1880 no estimates required.

1870—women between 18 and 44 given in the tables;

* Twelfth Census: Supplementary Analysis and Derivative Tables, p. 409, ff.

women 16 or 17 estimated by assuming (a) that the white women 16 or 17 bore to the reported number 15 to 17 in 1870 the same proportion (68.1 per cent.) that they did in 1880; (b) that the colored women 16 or 17 bore to the reported number 15 to 17 in 1870 the same proportion (65.65 per cent.) that they did in 1880. By this method 90.1 per cent. of the total number of women was obtained by enumeration and any error in the estimate would be reduced to one-tenth in its effect on the total.

The following table shows the estimated number of women 16 to 44 years of age at each census between 1800 and 1900 with the proportion derived from estimate.

Date.	Women 16 to 44 years of age.	Per cent.	
		Enumerated.	Estimated.
1900	16,985,694	100	0
1890	13,784,592	100	0
1880	10,896,564	100	0
1870	8,497,402	90.1	9.9
1860	6,773,106	69.6	30.4
1850	5,004,665	68.3	31.7
1840	3,567,690	64.9	35.1
1830	2,637,838	64.1	35.9
1820	1,888,088	89.9	10.1
1810	1,396,007	79.7	20.3
1800	1,023,554	79.9	20.1

It will be noticed that the largest proportion (35.9 per cent.) was determined by estimates in 1830 and that for earlier dates, notably 1800, 1810 and 1820, the margin of probable error is much less. This is important because it is the general trend rather than the figures for any single year that is important.

Estimated number of children under 5 years of age.

The following table shows in like fashion the number of children under 5 years of age enumerated or estimated for each census.

Date.	Children under five years of age.	Per cent.	
		Enumerated.	Estimated.
1900	9,189,448	100	0
1890	7,634,693	100	0
1880	6,914,516	100	0
1870	5,514,713	100	0
1860	4,836,579	100	0
1850	3,497,773	100	0
1840	2,978,838	81.3	18.7
1830	2,313,576	81.8	18.2
1820	1,752,740	0	100
1810	1,362,459	0	100
1800	998,690	0	100

The question arises, How is it possible to estimate the total number of children under 5 years of age in 1800, 1810, or 1820 with any approach to accuracy? The census gives for each of these dates the number of white children under 10 years of age with distinction of sex, and the problem is to determine what proportion of these children were under 5 years of age. From the censuses after 1820 the following per cents. may be computed.

Date.	Per cent. that white children under 5 years made of those under 10 years of age.	
	Male.	Female.
1830	55.4	55.0
1840	55.4	55.0
1850	51.8	51.7
1860	53.9	53.8
1870	53.3	53.1
1880	51.7	51.5
1890	50.6	50.3
1900	51.0	50.9

The table warrants the assumption that the male white children under 5 in 1800, 1810, and 1820 were about 55.4 per cent. and the female white children under 5 about 55.0 per cent. of those of the same sex under 10 at the specified date.

For the slaves and free colored population in 1820 there is a classification by sex and into four age periods, the lowest of which is under 14. Of those enumerated as under 14 the number under 10 of each sex was estimated according to the percentages in 1880. Of these estimated numbers under 10 the numbers under 5 for each sex were estimated according to the percentages in 1850.

The problem of estimating the slave and free colored population under 5 years of age in 1810 was even more complicated. Only the total of both sexes and all ages is given. The number of males and females was estimated by assuming that the proportions of the sexes were the same as in 1820. From these the numbers under 10 of each sex were derived by assuming the proportions found in 1830. From these again the numbers under 5 of each sex were estimated by assuming the proportions prevailing in 1850. Notwithstanding the numerous assumptions on which these estimates must be based, all that is known about the persistence of sex proportions and age proportions through short periods of time warrants the conclusion that the results are accurate enough to be better than complete ignorance and to be accepted as indicating the trend of change.

Another and perhaps a more accurate method for estimating the women between 16 and 44 has been tried and gives results smaller by some 3 to 4 per cent. As acceptance of these results would be favorable to my argument, I have rejected them. I believe that the proportions stated in the following table for the earlier censuses are probably below rather than above the truth and that the actual decline in the birth rate was slightly greater than the apparent decline.

Proportion of children under 5 to 1,000 women 16–44.

Date.	Number women 16–44.	Number children under 5.	Number children to 1,000 women.
1900	16,985,694	9,189,448	541
1890	13,784,592	7,634,693	554
1880	10,896,564	6,914,516	635
1870	8,497,402*	5,514,713	649*
1860	6,773,106*	4,836,579	714*
1850	5,004,665*	3,497,773	699*
1840	3,567,690*	2,978,838*	835*
1830	2,637,838*	2,313,576*	877*
1820	1,888,088*	1,752,740*	928*
1810	1,396,007*	1,362,459*	976*
1800	1,023,554*	998,690*	976*

*Estimated.

The preceding table shows that the proportion of children to women of child-bearing age and so probably the birth rate in the United States was not stationary or increasing prior to 1860 as has usually been supposed and as the figures for 1850–1860 taken alone would indicate. On the contrary that decade was probably the only one during the entire century marked by an increasing birth rate and the rapidity of the decline between 1810 and 1840 was about the same as that between 1860 and 1900. The abnormal decrease between 1840 and 1850 in the proportion of children is probably due in the main to the arrival of many immigrant women during that decade especially from Ireland and Germany, and the lack of a proportionate number of births or perhaps the high rate of mortality among children born between 1845 and 1850. The increase of this proportion between 1850 and 1860 may be ascribed to the greater fecundity among these immigrant women or the lower mortality of their children in the following decade. Since 1840 decades of very great immigration (1840–50 and 1880–90) or of war (1860–70) have been characterized by an excessive decline in the proportion of children and the decades immediately following by a return towards the normal proportion. The main conclusion that the decrease in the proportion of children began in the United States as early

as 1810 and has continued at about the same rate ever since is clearly established by the evidence.

France is the only European country in which the birth rate is known to have attained its maximum so early in the century and to have declined steadily ever since. As the French figures show the rates of births each year to the total population and the American figures the rates of living children under 5 years of age to 1,000 women 16 to 44 years of age, they cannot be directly compared. To reduce them to a common denominator the following method has been used.

(1) The average birth rate in France has been found for each five-year period ending with the year in which an American census was taken, viz., 1806–10, 1816–20, etc.

(2) The resulting series has been expressed as ratios of the birth rate 1896–1900 taken as 100 per cent.

(3) The series showing the proportion of children to women in the United States at each census since 1810 has been expressed similarly as ratios of the proportion in 1900 taken as 100 per cent.

(4) The proportion of children under five years of age to 1,000 women 16 to 44 years of age in the United States in 1900 being 541 and in France in 1901 being 425,* 441 has been added to each number in the American series and 325 to each number in the French series.

The results of this computation are given in the following table:

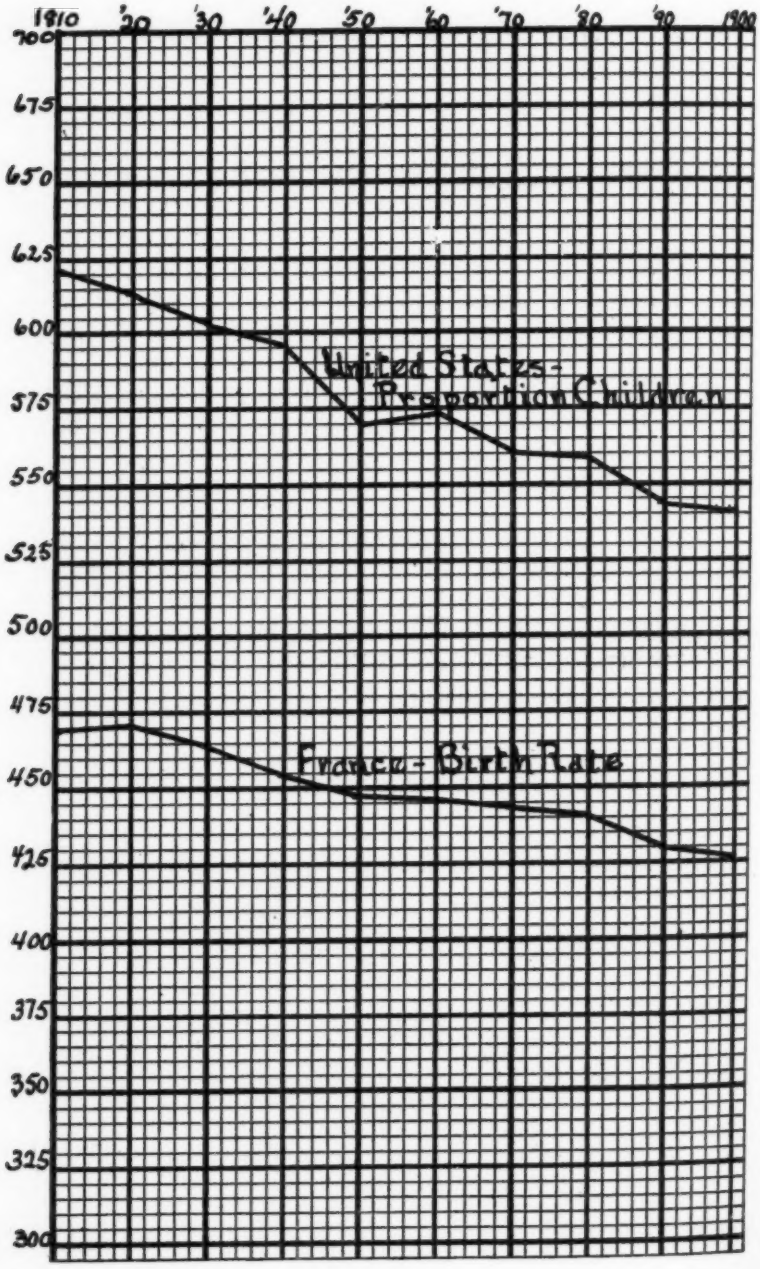
* To find this proportion the number of women 15 years old in France has been estimated and subtracted from the number 15–44 years of age.

Date.	Average birth rate per 1,000 population for preceding 5 years.	Proportion of children under 5 years of age to 1000 women 16 to 44 years of age.	Ratio of numbers for preceding years to those for 1900 = 100 per cent.		Ratios increased—	
					By 325 for	By 441 for
	France.	United States.	France.	United States.	France.	United States.
1900	22.0	541	100.0	100.0	425	541
1890	23.1	554	104.9	102.4	430	543
1880	25.3	635	115.2	117.4	440	558
1870	25.9	649	118.0	120.0	443	561
1860	26.6	714	121.0	132.0	446	573
1850	26.7	699	121.7	129.2	447	570
1840	28.4	835	129.0	154.3	454	595
1830	30.5	877	138.8	162.1	464	603
1820	32.0	928	145.5	171.5	471	613
1810	31.7	976	144.0	180.4	469	621

The preceding table suggests that the proportion of children in the United States has uniformly been greater than in France, but that the difference between the two countries has been a decreasing one. The average French birth rate 1896–1900 was 69.4 per cent. of the rate 1806–1810; the American proportion of children in 1900 was only 55.4 per cent. of what it was in 1810.

The last two columns may be expressed in the form of a diagram.

PROPORTION OF CHILDREN IN UNITED STATES AND BIRTH RATE IN FRANCE 1810-1900 COMPARED.



The diagram illustrates what the figures clearly reveal, that the birth rate in the United States is and has been much higher than in France but that its decrease for nearly a century has been almost as regular and much more rapid. There is no indication in either country that the rate of decrease is becoming less rapid and so the lines of the diagram tending to become more nearly parallel to the base. No doubt that will be the ultimate change, but for the ninety years covered both lines have been approximately straight. It is easy to compute when either line would meet the base if its direction remained unchanged, but such a computation would have value not as a prediction but only as a graphic way of stating the magnitude of past changes.

THE CENSUS AGE QUESTION: A REPLY.

By WILLIAM B. BAILEY and JULIUS H. PARMELEE.

Before 1900 not more than one question regarding age had ever been included in the population schedule of the various American censuses. The question had always related to age at last or nearest birthday. For the Twelfth Census, however, an additional age question was inserted—"year and month of birth." As it was the aim of the Census Bureau to keep the number of queries on the population schedule for the Thirteenth Census as few as possible, it was inevitable that one of the two age questions utilized in 1900 should go. To assist in reaching a decision as to which question could best be spared, a study was made by us of the contention that the addition of the date-of-birth inquiry in 1900 had been responsible both for the increased general accuracy of the age returns, and for the decreased concentration on multiples of five. This study seemed to show that the effect of the addition of the date-of-birth query had been somewhat overestimated, and it was decided, therefore, to retain only the inquiry regarding age at last birthday.

The principal facts discovered by our study appeared in the June, 1910, number of these publications, and brought forth keen criticism from Prof. Allyn A. Young in the December, 1910, issue. Such part of Professor Young's article as deals with the inferences or opinions expressed by us we prefer to leave untouched till the age returns of the Thirteenth Census become available. It will be possible within a few months to throw the light of considerable new material on the subject. We shall take up here only two of the specific criticisms made by Professor Young—criticisms that seem to us to be especially faulty or wide of the mark. Professor Young asserts that we failed to give sufficient weight to European experience, and that in our

discussion of the artificial shifting of ages to ages ending in 4 and 9 the statistical evidence proved too much.

Our first paper was prepared on the principle that the reliability of the replies to the double age question in 1900 could be tested only by a study of the evidence directly afforded by the Twelfth Census population schedules. The conclusions set forth in the paper were based, not on European practice or on the recommendations of a statistical congress which may not have been familiar with American census problems, but on the returns actually received and handled by the American Census Bureau in 1900.

On page 368 Professor Young questions our conclusion that the date-of-birth inquiry seems to have been credited with more than its real effect in the improvement of our age statistics. We are forced to an emphatic dissenting opinion. A certain amount of decrease in concentration on multiples of 5 has occurred regularly for several decades, and could be expected to occur between 1890 and 1900, whatever the form of the age question. On the face of it, therefore, it would not seem that the decrease in concentration in 1900 of itself established the efficacy of the two-question policy, especially as the decrease in 1900 was less than the decrease in 1890. We pointed out, moreover, that part of the 1900 decrease was due to artificial adjustments in the age returns which we believed to be unjustified. Making allowance for this artificial decrease, we find the decrease in concentration on multiples of 5 in 1900 as compared with 1890 even less. Thus the process of lessening age concentration was considerably retarded in 1900, and no great virtue seems to be indicated for the additional age question in that year.

Professor Young goes a step farther on page 368 and accuses us of having proved too much when we pointed out that the artificial shifting of ages brought about by editorial adjustments of the age returns on the census schedules was responsible for a decrease in concentration on multiples of 5 amounting to 2.9 per cent. In a footnote he estimates the increase that would have taken place in 1900 in the proportion of persons reported at ages ending in 9 had such increase been

in the same ratio to the decrease in relative number of ages ending in 0 as was the 1890 increase in the proportion at ages ending in 9 to the 1890 decrease in the proportion at ages ending in 0. Unfortunately Professor Young's arithmetic deserted him in making up this estimate. Three of the four percentages in his footnote* are incorrect, and the increase estimated by him as 0.8 per cent. should actually have been stated as 9.4 per cent. The corrected footnote reads as follows:

"A decrease of 8.7 per cent. in the relative number of reported ages ending in 0 in 1890 as compared with 1880 was accompanied by an increase in the relative number reported as ending with 9 of only 6.6 per cent. On this basis, the decrease of 12.4 per cent. in the number of reported ages ending in 0 in 1900 as compared with 1890 would have been accompanied by an increase of 9.4 per cent. in the relative number of reported ages ending with 9."

This 9.4 per cent. plus the 2 or 3 per cent. estimated by Professor Young† to represent the artificial shifting of ages from ages ending in 0 to those ending in 9, fully accounts for the 12 per cent. of increase that actually took place in 1900 in the relative proportion of ages ending with 9. The number of ages ending in 9 was below normal both in 1900 and 1890. Their approach toward the normal number was no greater, relatively speaking, in 1900 than in 1890, allowance being made for the artificial shifting already mentioned. In this respect the addition of the date-of-birth question would not seem to have proved of great advantage. Our contention, therefore, instead of "losing what had been its statistical support," is on the contrary strengthened by applying Professor Young's own mathematical test.

*It is but fair to Professor Young to state that when his attention was directed to the errors in this footnote he made the same changes as those given here.

† His language is as follows: "I estimate that the artificial shifting described above (if it was as frequent as Professor Bailey and Mr. Parmelee estimate) was responsible for between 2 and 3 per cent. in this increase."

REVIEWS AND NOTES.

SICKNESS, AND MORTALITY EXPERIENCE OF THE LEIPZIG COMMUNAL SICK FUND, 1887-1905.*

The Leipzig communal sick fund embraces several local sick clubs, the aggregate membership in 1909 being 172,617 persons. The fund includes both compulsory and voluntary members, and is by far the most important institution of its kind in the world. It is very gratifying, therefore, to be able to state that the extended experience, mortality and sickness, of this institution for the period 1887 to 1905 is now available to students of life and sickness insurance. The investigation of this experience has been made in great detail and in strict accordance with the best methods of actuarial and statistical science. Sex, age, and occupation are the three primary distinctions maintained throughout the investigation and all the essential facts are also reported separately for the compulsory and voluntary memberships.

The detail work of this great investigation was done by the Imperial Statistical Office with the coöperation of the Imperial Board of Health. The cost of the undertaking which amounted to about $77,350 (325,000 marks) was met by a special appropriation voted by the Imperial Parliament, March 23, 1903.

In any brief review it would be impossible to deal with many of the detail facts disclosed by this experience, and I shall therefore merely point out some of the many lines of inquiry along which the investigation was conducted. The total experience reported upon consisted of 996,445 males and 288,131 females exposed to risk an average of one year. Of the total membership, 1,212,256 were compulsory and 72,320 were voluntary members, and the distribution of the exposure by sex and class of membership was as follows:

	Males.	Females.	Total.
Compulsory membership	952,674	259,582	1,212,256
Voluntary membership	43,771	28,549	72,320
Total	996,445	288,131	1,284,576

* Krankheits—und Sterblichkeitsverhältnisse in der Ortkrankenkasse für Leipzig und Umgegend. Berlin, Carl Heymans Verlag, 1910.

Exclusive of persons employed on railways and in navigation, practically the whole industrial population of Leipzig and vicinity was included in the inquiry. It so happens that the more dangerous and unhealthful trades are included only to a limited extent, as these trades are not widely represented in Leipzig and its environs. The investigation, however, offers to the student the great advantage of presenting the facts in detail both for groups of occupations and for the specific occupations included in the groups. As an indication of the detailed nature of the published results, it may be stated that 323 specific causes of sickness and death are included, and 108 specific occupations of males and 79 specific employments of females are presented in correlation with age and class of membership distinctions.

The report is published in four large volumes aggregating more than one thousand pages. The first volume of 212 pages is entirely devoted to introductory and explanatory matter, summary tables, important conclusions, etc., and the other three volumes contain only the fundamental detail tables, arranged, however, in a systematic manner according to a simple scheme fully explained in the first volume. For example, the second and third volumes give the detail statistics of male members, while the fourth volume contains only statistics of the female membership.

Throughout the investigation careful distinction is made of sickness cases and days of sickness, special emphasis being placed upon the average duration of sickness cases. This information is of special value as it is given by causes of sickness and by specific occupations. The ratios of cases of sickness and of days of sickness per annum per 100 members, with distinction of sex and class of membership—compulsory and voluntary, are presented in great detail with due regard to age periods of life. Wherever the numbers are large enough to justify it, the age divisions are by five year groups from 15 to 74 with two other groupings, one for those under 15 and the other for those 75 and over. The mortality data are presented in actual number of deaths and per 100,000 observed years of exposure. Ratios of deaths to sickness cases and to days of sickness are also presented in detail by age, sex, occupation, class of membership, etc. Great emphasis is also placed upon industrial accidents, particularly accidents met with in the specific employment in which the insured was engaged at the time of his injury. An exceptionally valuable body of facts is presented in this connection for the duration of the disability is given together with the ratio of accident disability to the total sickness disability, which includes disability resulting from accidents.

In volume three a special series of tables are presented for what are termed "Alkoholiker" or cases where there was clear indication made on the sickness card by the medical attendant that the case was an excessive or immoderate drinker. Among other important conclusions deduced from these tables may be mentioned an excessive mortality rate at all ages, an excessive sickness rate, both by cases and days, and an excessive industrial accident frequency. So important were the latter differences shown to

be that the following comment was made in the analytical text: "In a large number of accidents to excessive drinkers it is clear that immoderate alcoholic indulgence resulted in uncertainty of movement, lack of skill, inattention, and lack of care." At ages 25 to 34 accident cases of durations less than 28 days were 3.1 times more frequent among the excessive drinkers than among all males; and for cases of durations above 28 days the relative frequency was 3.5 for the excessive drinkers. The mortality of the excessive drinkers was in excess of the general experience at all ages, and in the following ratios:

Ages.	Death Rates per 1,000 Exposed one Year.		Ratio of Rates.
	Alkoholiker.	All Males.	Alkoholiker to all Males.
25–34	12.2	5.3	2.3
35–44	28.4	9.7	2.9
45–54	37.2	16.7	2.2
55–64	36.4	29.8	1.2
65–74	74.6	58.0	1.3

In volume four a special series of tables are presented for childbirth cases. These tables, like those for excessive drinkers among males, present some very interesting and suggestive facts relating to the special subject treated. Such facts as premature births, abortion cases, etc., with the various complications resulting therefrom, are considered in detail with distinction of age and occupation.

This review is necessarily very limited, but in closing it cannot be too strongly emphasized that this latest mortality and morbidity experience, presented with such patience, skill, and clearness, must be regarded for a long time to come as one of the greatest storehouses of facts on the problems with which it deals. Much new light has been thrown upon old problems and many new problems are suggested by even a casual reading of the analytical text and a study of the tables and diagrams.

F. S. Crum.

THE JEWS: A STUDY IN RACE AND ENVIRONMENT.

By Maurice Fishberg. The Walter Scott Publishing Co., Ltd., New York and Melbourne, 1911. Pp. 578.

This volume consists of a preface, twenty-three chapters of text, and a bibliography and index. There are a large number of reproductions of pictures and photographs and a few diagrams. After presenting data about the number and distribution of the Jews, the author proceeds to discuss physical characteristics (chapters II, III, and IV), the types of

Jews and their origin (chapters V, VI, and VII), proselytism and intermarriage (chapters VIII and IX), demographic characteristics (chapters X, XI, and XII), pathological characteristics (chapters XIII, XIV, and XV), social and economic conditions (chapter XVI), education (chapter XVII), occupations (chapter XVIII), criminality (chapter XIX), political conditions (chapter XX), social disabilities (chapter XXI), and assimilation versus Zionism (chapter XXII). The final chapter (XXIII) contains a recapitulation and the author's conclusions.

This enumeration of titles suggests the wide range of subjects with which the author undertakes to deal. The leading thought of the book is that the Jews are not a race by blood since they have intermarried with Gentiles with considerable freedom in early days and have done so again whenever and wherever they have achieved political and economic equality. The so-called Jewish characteristics, physical, demographic, pathological, social, and occupational, are greatly exaggerated by most writers, according to Fishberg, and to the extent that they exist at all, they are largely due to environment, or *milieu*, as the author loves to call it.

The Jew's existence is due to his persecution, according to the author, and when the persecution ceases the Jews become amalgamated with the people among whom they live. The process of assimilation is much more widespread than is popularly believed, even in countries where the Jews labor under legal disabilities, as witnessed by the fact that as a general rule the Jews in one country differ from their coreligionists in another in substantially the same manner as the Gentiles of the respective countries differ from each other. Zionism is an idle dream, according to Fishberg, because no large number of Jews could be induced to leave their present abodes for the new Zion, and even if they wished to emigrate there is not sufficient space in Palestine to hold them all, nor is there any other unoccupied land to which the Jews could turn for the founding of a new fatherland. They will always remain a minority, and the wished-for Jewish state can never become a reality.

The evidence presented by the author is derived from three sources: (1) Statistical publications; (2) anthropological, medical, ecomonic, historical, and social studies of the Jews by other authors, and (3) the author's own measurements and observations in the United States and other countries.

So far as the statistical evidence is concerned, it must be said in the first place that the author uses for the most part secondary sources and without verification which, in a book with scientific pretensions, is always regrettable. Thus, for instance, the number of Jews in the United States is given as 1,777,185, according to the American Jewish Year-Book, without further investigation (p. 8); the author adds, however, that the numbers given by this authority are below the real numbers and that "it is fairly established that New York City alone has about one million Jews.' No evidence is produced to support this doubtful statement, and yet it seems reasonable to expect that if a fact of such fundamental importance

to the discussion as the number of Jews in New York City is "fairly established," the readers are entitled to see the evidence establishing it.

That the author's use of his statistical data is not always careful and lucid is seen from the following examples: On page 260 the author presents a series of percentages of the age distribution at death of Jews and of Christians in Amsterdam. In discussing the figures the author does not say that among the Jews a smaller proportion of dying persons are children, but without hesitation, draws the conclusion that infant mortality is lower among Jews, which conclusion does not necessarily follow from the low per cent. of children among those who die, since birth rates are the other factor which may influence the age distribution at death. The statement, as made, is misleading and logically leads to the absurdity stated on page 262 that "among persons of advanced age the rates are higher among the Jews simply because a larger number of Jews reach that age."

On page 206 the following statement occurs: "The percentage of mixed marriages in 1903 was as follows: Unitarians, 167.73; Protestants, 49.39; Reformed Church, 48.52; Greek Catholic, 42.79; Greek Oriental, 16.88; Jews, 7.21." The per cent. over one hundred is naturally thought to be a misprint, but the author silently assumes that the reader will read his mind and understand that what is meant is not the percentage that mixed marriages form of the total number of marriages, but the percentage of mixed marriages if the unmixed marriages are assumed to be 100.

In the discussion of the offspring of mixed marriages on page 218, the author assumes that all such offspring who do not become followers of the Mosaic faith are numerically a loss to the Jews. It is perfectly obvious, of course, that if a Jew marries a Gentile wife and a Jewess a Gentile husband, and if half of the children of both couples become Jews, the effect on the number of Jews in the world, barring the question of comparative fecundity, will be the same as if the Jew and the Jewess married each other and all their children were Jews. Thus a numerical loss can only be spoken of when more than half of the offspring become Gentiles.

These and similar mistakes, partly in form and partly in reasoning, are found on many pages of the book and are sufficient to undermine the statistician's confidence in the author's statistical conclusions.

As regards the other sources of evidence, it seems that the author has covered the literature of the subject fairly well, but his chief idea about the lack of racial characteristics and the undesirability of separativeness, is at times prone to lead him to conclusions that are not supported by any evidence adduced, as, for instance, on page 369, where the author speaks of "the most separative ritualism of their religion, which is just as effective in keeping them backward as the legal restrictions." This statement is not only not susceptible of proof, but is inconsistent with the author's general contention that legal emancipation for the Jews invariably results in progress and assimilation.

As regards the author's own measurements and observations, which at times are pitted against the views of other observers, it is but fair to say

that the reader is entitled to a more detailed statement of their extent and method before he is ready to accept them as final vindications of the author's contentions.

One more quotation: On page 441, the author, speaking of the social discrimination practiced in this country against the Jews, as witnessed by the refusal of certain hotels and schools to accept Jews as guests or pupils, asserts that "the isolation of the Jew is in this repsect as stringent as it was within the gates of the mediæval Ghetto." We can not refrain from remarking that, humiliating as such discriminations are to the members of the Jewish race, the above is a gross overstatement of their efficacy and importance.

To sum up, the book, which undoubtedly contains much of value, needs a careful scrutiny of the statistical evidence and the elimination of all that is not strictly accurate; it needs a careful revision to avoid misleading statements and ill-considered reasoning; and, finally, it needs to be purged of all bias and exaggeration before it can be accepted as a real contribution to the scientific literature on the Jews.

E. A. GOLDENWEISER.

Washington, D. C.

THE AMERICAN YEAR BOOK.

D. Appleton and Company, New York. 1911. Pp. xx, 867.

The first issue of the American Year Book fully justifies the enterprise of the publishers. It is unique in plan, comprehensive in its scope, authoritative and accurate in the matter it presents, and characterized throughout by good sense, both in what is included and in what is excluded. All this might have been predicated in advance of a work in the preparation of which so many men eminent in their respective departments of knowledge took a part; over the details of which a wise advisory board presided; and the actual collation and arrangement of which was entrusted to the hand of Dr. S. N. D. North.

In effect the Year Book is a condensed annual encyclopedia. It contains substantially all that the ordinary man will wish to know when he is seeking for the "record of progress" in any field of politics, foreign affairs, science, education—in short, of anything which is worth knowing; and it outlines all that the student in any field will need to know in order to prosecute research further. That is all that can be expected of a manual upon the plan of this. Of course it does not displace and supersede all other annuals. The biggest and most comprehensive of all—a bigger and more comprehensive one than any now in existence—could not contain all that every one would find sufficient. But it is high praise, and fully deserved, to say of this Year Book that those who have it at hand will be likely to turn to it first for any information they desire on any subject relative to the progress of the world during the period it covers.

It is not necessary to give a detailed summary of its contents. It is divided into thirty-five parts, each of which is contributed by one or more persons, and the list of contributors numbers more than ninety names. Thirty-two learned or technical societies coöperated, more or less, though all coöperated actively in the preparation of the matter. Nearly fifty of the contributors are professors or instructors in American universities and colleges, and the rest are experts—many of them in the service of the national government—in the subjects treated by them. The arrangement of the book is admirable. By grouping all the matter relating to any one general topic in a single department, and by supplementing the whole work with an excellent index, the vexations often inevitable when one is consulting an annual handbook alphabetically arranged, are completely avoided.

EDWARD STANWOOD.

ANNUAL REPORT FOR 1909 OF THE CHIEF MEDICAL OFFICER OF THE BOARD OF EDUCATION (LONDON), 1910. 11d.

In 1907 the Education Act required each Local Education Authority to provide for the medical inspection of children immediately before, or at the time of, or as soon as possible after their admission to a public elementary school, and on such other occasions as the Board of Education direct. The Code for 1909–10 required that all children admitted since the first of August, 1909, and all children who were expected to leave school before July 31, 1910, should be examined with regard to the conditions of health and physical development. Perhaps this second group called "leavers" is the more important since it will tell the story of the practice or neglect of hygiene during school life and may determine certain questions of employment of the child. In addition they examined any children who were reported by the teachers to be in bad physical condition. It is probable that at least 250,000 of this special class were examined. To carry out this Act has required the examination of about a million and a half children. The provisions of the Act and the Code have been generally obeyed throughout the Kingdom with the exception of London.

Since the examinations were not uniform throughout the whole Kingdom it is difficult to give any statistics approaching absolute accuracy, but it may be stated in general terms that of the six million children in the public elementary schools of England and Wales, about 10 per cent. are defective in vision, from 3 per cent. to 5 per cent. defective in hearing, 8 per cent. have adenoids or enlarged tonsils of sufficient degree to require surgical treatment, from 20 per cent. to 40 per cent. suffer from extensive and injurious decay of the teeth, about 1 per cent. are affected with tuberculosis, and from one half per cent. to 2 per cent. are afflicted with heart disease. These figures certainly give a somewhat gloomy picture of the condition of the pupils in the elementary schools. No statistics on a large scale have

ever been gathered in this country so that it is impossible to introduce comparisons, but from the figures which are available in this country it is apparent that conditions among our public school children would well repay state-wide study. This report is filled with interesting studies of local conditions and gives a very good idea of the extent of the effort which is being made in England to insure to the country a healthy working population.

WM. B. BAILEY.

Yale University.

REPORT OF COMMITTEE ON STANDARD TABLES.

The undersigned members of a committee appointed at the last annual meeting of this Association to coöperate with a committee of the American Public Health Association to consider forms of tables employed in registration reports, federal, state, and municipal, and to draft a set of standard tables, have the honor to submit the following report of progress.

The form of statistical tables is dependent primarily upon the information which the tables are to convey. That information always consists in certain statistical totals combined in various ways. In American registration reports, as a class, the space given to tables regarding deaths greatly exceeds that given to all other tables. For this reason the present report is confined to mortality tables.

American registration of deaths is now based in nearly all cases upon a standard certificate. Hence the information open to tabulation is practically identical. Part of the information conveyed on a certificate is merely for identification or corroboration and has no statistical value. This is true regarding the decedent's name and that of the father and mother, the date of birth as distinguished from the age, the length of residence, the place and date of burial, and the name and address of the undertaker. After excluding these items, there remain for use in statistical tabulation the following:

(1) Place of death,
(2) Time of death;

as physical characteristics of the decedent:

(3) Sex,
(4) Age,
(5) Race or color,
(6) Cause of death;

as social or economic characteristics of the decedent:

(7) Birthplace,
(8) Birthplace of father,
(9) Birthplace of mother,
(10) Marital condition,
(11) Occupation.

The deaths are thus susceptible of classification under each of these heads and each possible combination of them and the living population as reported by a census, or as estimated for other than census years, may be similarly classified. The proper classification of deaths is the primary object of all mortality tables in registration reports, the presentation of ratios between the annual deaths in a certain group and the enumerated or estimated living population in that group is the secondary object.

Tabulations with reference to a single characteristic seldom have much scientific or practical value. Thus, to know the number of females who died in 1910 or the number of persons who died of tuberculosis in that year is of little importance. But when the persons dying of tuberculosis are classified by sex, age, and occupation, and the living population is classified in the same way and rates computed, the results become significant. There is little use, then, in tabulating separately for each of the eleven characteristics previously mentioned. The tables should show combinations of these eleven in various ways. These combinations may be dual like sex and nativity; triple like sex, age, and occupation; quadruple like sex, age, occupation, cause of death, etc.

The extent of the tabulation of death statistics by registration states and cities and the manner of presenting the results of this tabulation are problems concerning primarily the registration offices. We may point out, however, that the meager and badly planned tables in many state and city reports are depriving the public of the sound and accurate knowledge of present conditions which is needed for the proper development of the public health campaign.

Your committee has had reason to believe that a series of standard tables which might be introduced in future reports of state and city offices as a supplement to or a substitute for those heretofore published would be welcomed in some quarters. Such tables also are demanded by the vote of the American Statistical Association appointing the committee.

In preparing these tables it is possible either to start with the present procedure of our states and cities and attempt to systematize it, or to disregard that experience and start afresh. Your committee believes that the former is the proper method and has therefore inquired, What combinations of statistical data are now presented? To secure an answer to this question the latest available registration reports of every registration state and of ten registration cities, selected on the basis of size and location, have been examined. New York State and South Dakota were disregarded because of the almost complete absence of classification of deaths in the reports of those states. The District of Columbia was treated as a state rather than as a city. This gives a total of sixteen registration states. Of these sixteen the number which tabulate the several items without combination is as follows:

Item.	Number of registration states in which it is tabulated.
Place of death	16
Cause of death	14
Sex	7
Age	7
Time of death (month)	6
Birthplace (native or foreign born)	4
Race or color	2
Nativity of parents	1
Marital condition	1
Occupation	1

The number of possible combinations of two items in a series of eleven is determined by a simple mathematical formula to be fifty-five. Of these the following are found most commonly in the sixteen registration states:

Combination.	Number of registration states in which it is tabulated.
Cause and place	13
Sex and cause	10
Sex and place	10
Age and cause	10
Time and cause	9
Sex and age	8
Place and nativity	7
Age and place	7
Place and color	5

Of the fifty-five possible combinations of two items these nine are found in at least five of the sixteen states, eleven are found in from one to four states and thirty-five are not found in any state. As examples of dual classifications of deaths not now made in any registration state, the following may be named,—a classification by sex and occupation, by sex and marital condition, by age and nativity, by occupation and race.

An examination of the tables published in the reports of the ten selected

cities does not show any significant difference between the state and city forms.

Your committee recommends, then, that all states and cites not now giving this information be urged so to modify their tables as to include in them the eight dual classifications already furnished by at least seven of the registration states, namely:

Sex and age,
Place and sex,
Place and age,
Place and nativity,
Place and cause,
Cause and sex,
Cause and age,
Cause and time,

and that all states and cities having more that ten per cent. of negroes, Chinese or Japanese in their population be urged to tabulate also by place and color.

In a series of eleven items the number of combinations between three items which is mathematically possible is one hundred and sixty-five, or three times the possible number of two combinations. The possible combinations of four items is three hundred and thirty. But the labor and cost of tabulating in this way are far greater than those required for two. It is not surprising, therefore, to find that, while of the fifty-five possible combinations of two items, 20, or 36 per cent., are found in at least one state, of the one hundred and sixty-five possible combinations of three items only 25, or 15 per cent., are found in at least one state, and of the three hundred and thirty possible combinations of four items only 10, or 3 per cent., are found in even one state and only one is found in two states. Having in mind this omission of complicated tabulations by American states and cities at the present time and also the difficulty and cost of introducing them, your committee does not recommend any material extension of the work of municipal and state registration offices into those now unoccupied fields. It suggests, indeed, that these fields are just the ones in which the Federal government, acting through the Bureau of the Census, may best aid city and state health work by preparing such complicated and expensive tables for the registration area and its leading divisions. But while it is convinced of the wisdom of this general principle your committee does urge the inclusion of one table (Table 1) giving the triple combination by sex, age and cause of death as far more valuable and no more difficult to prepare than the three dual combinations by sex and age, sex and cause, and age, and cause now found in at least one third of the registration states.

To make its recommendations more specific and thus, perhaps, more helpful it submits the following drafts of tables.*

* These drafts of tables will shortly be published by the Census Bureau. They are omitted here for lack of available space.

The preceding five tables include all the combinations of two items now presented in any five of the registration states and thus may be regarded as a sort of codification of prevailing practice in American states and cities. They are to be regarded merely as a minimum that should be included in every state and city registration report, and not as precluding the retention or formation of other tables. In fact, a series of desirable supplemental tables will be considered by this Committee for presentation later to the Association and the coöperating agencies (American Public Health Association and Bureau of the Census), but the matter of greatest present importance is to make a beginning, with a few simple yet fundamental tables, the general adoption and practical use of which in state and city reports will pave the way for further progress. If too elaborate a set of tables be recommended at the outset, it is likely that they will not generally be adopted.

As an aid to the execution of this plan, it is suggested that, if the coöperating Committee of the American Public Health Association approve, these standard tables be recommended for adoption as "Rules of Statistical Practice" by the organized registration officials of the country. This will, of course, require action at the next meeting of that Association which will be held at Havana next year, and in the meantime the forms of tables can be scrutinized thoroughly and perhaps some additional tables be recommended.

WALTER F. WILLCOX.
THOMAS S. ADAMS.
FREDERICK S. CRUM.
C.-E. A. WINSLOW.
ALLYN A. YOUNG.

Business Barometers Used in the Accumulation of Money. By Roger W. Babson. Wellesley, Mass., 1911. 4th ed. Pp. 380.

The modern prophet, whether it be weather, population, or the stock-market that he predicts, sits on a pile of figures: the tripod is obsolete. Statisticians do not announce "laws," and then fit the facts to them; but rather try to deduce principles from the figures. A prediction of the course of the stock or bond market, or of any of its subsidiary phenomena, such as money-rates, possesses much more interest to the general public than a prediction of the growth of population, for the former seems to offer a chance to make money. Mr. Babson's book, which is semi-popular in character, contains, nevertheless, some account of the statistical methods by which, he says, the "major movements" of security prices and money-rates can be foretold, and on these methods some comments suggest themselves.

Current figures on some twenty-five subjects are first collected and tabulated: these figures include statistics of building and real estate, bank

clearings, business failures, labor conditions, money conditions, foreign trade, gold movements, commodity prices, stock exchange transactions, crop conditions, railroad earnings, and social conditions. From these a composite index number is made and plotted. On the same diagram a curve showing the course of the average price of "32 leading stocks" is set forth, along with a curve of bond prices and money-rates. There appears to be a remarkable correspondence between the curve of stock prices and the index curve; and, indeed, that might be expected, since all the phenomena included in the index curve influence prices. Moreover, the price of stocks—at least, since 1903—seems to have risen and fallen slightly in advance of the index number: inference, Wall Street discounts the future. How then, are we to discount Wall Street?

At this point, Mr. Babson introduces the reader to "a law under which mechanics, medicine, and other sciences move, namely, that action and reaction are equal." This broad principle he applies as follows: First, the curve of stock prices and the curve showing the course of the index number; then a nearly straight, slanting line is drawn across the diagram, above the base line, and rising toward the right. This line is said to represent the normal progress of the country: let us call it X-Y. Now for our law: since action and reaction are equal, the *area* under the curve of the index number and *above* the line X-Y must be equal to the area *under* the line showing normal progress and included by the index curve, on the average. That is, the index curve rises above and dips below the straight line which represents normal progress. When it has been above for some time, we may expect it to fall below.

How is one to know when the index curve may be expected to drop below normal? The areas under this curve may be long and thin, or short and high, and still be equal. Mr. Babson's answer is that one must watch the "rate of flow."

It is obvious that on the slope of the line which represents the normal expansion of business depends the whole theory of this "equality of areas." Before 1903, the slope of this line was comparatively steep, but at 1903 it became much more gradual, and continued from 1903 to date in a *straight* line in the third edition of Mr. Babson's book, published in 1910; but in the fourth edition the slope had again changed, this time at the beginning of 1907. How is this line located? Mr. Babson says: "If there was any way to locate with mathematical exactness the line of growth, we of course would do so; but . . . economists have been unable to do so. Therefore, as the above is true" (referring to the "law of action and reaction") "and as the outline of our black areas approximately represents actual conditions then *if we locate thereon some line which will make said areas above and below the line of normal growth equal, we are justified in assuming that said line is the line of normal growth.*" This line is "subject to revision each year." (p. 107.) Since this line is drawn so as to *make* the prosperity and depression areas equal, no inference as to the correctness of the "law of action and reaction" seems permissible from the diagram, and none is

attempted. But in the note printed on these composite plots, it is said "The line X-Y represents the normal growth of the country's business, the slope being changed whenever there is a change in the trend of conditions as shown by clearings." This might lead one to suppose that the line X-Y and the index curve were based on independent data, and hence that the equality of these areas was strong proof of the "action and reaction" theory on which they were constructed; but of course no such conclusion follows.

On the other hand, such work as this, being pioneer in character, is naturally crude in some respects, but it does at least embody an interesting collection of statistical data on the current condition of business. Sixty-four pages of the book are devoted to a computation of how much money an investor who bought and sold at the right time would have made from 1860 to date,* and fifty-eight pages to a review of financial history, year by year, from 1860.

It is obvious that many more causes influence stock prices than the ones for which figures are used. It is impossible to diagram all the causes. Why not, then, apply the "law of action and reaction" directly to the curve of stock-prices itself? If this law is accurate, it should apply to the curve of security prices, for they are, in the long run, based on expert anticipation of all possible causes for variation in price. And therefore, why is it necessary to construct an elaborate index number? Perhaps, because a diagram of stock prices merely, seems too simple, since most people believe that Wall Street is as hard to harness to a "system" as its running-mate, Monte Carlo, unless it be for the "long swings."

In constructing an index number from such dissimilar elements as immigration, production of gold, idle cars, etc., it is obvious that some of the components should be given more weight than others. Nothing elaborate in the way of weighting is here attempted, bank clearings, domestic money rates and stock market transactions being merely given double weight. This is Mr. Babson's judgment: whether or not this method could be improved by weights based, say, on the correlation coefficient of each component with the stock curve, is an open question.†

Apart from all questions of statistical theory and method, however, there can be no doubt that a system like Mr. Babson's performs a distinct service to merchants and bankers, by enabling them to base extension and curtailment of credits and business ventures on something more than individual judgment. The diagram discussed above is itself a graphic representation of expert opinion of great interest both to statisticians and business men. Books like J. P. Norton's "Statistical Studies in the New York Money Market" (Macmillan, New York, 1902), E. W. Kemmerer's "Seasonal Fluctuations in the Demand for Money and Capital"

* *cf.* "How Money is Made is Security Investments, or, A Fortune at Fifty-five," by Henry Hall, New York, 1908, pp 71–101.

† *cf.* an article on "The Correlation of Economic Statistics," by Warren M. Persons, in the December, 1910, issue of these Publications.

(Washington, Government Printing Office, 1910), and others, in addition to their value as scientific studies, serve to show that statistical methods applied to sociological questions do not necessarily result in mere academic *tours de force*, but may have an instructive bearing on a practical question of perennial interest, namely, how to make money.

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